



## Levin-Richmond Terminal Corporation

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September 27, 2021

Ms. Karen Jurist  
United States Environmental Protection Agency Region 9  
75 Hawthorne Street  
San Francisco, California 94105  
Via email: [jurist.karen@epa.gov](mailto:jurist.karen@epa.gov)

RE: 2020-2021 Annual Report, United Heckathorn Superfund Site, Upland Capping System  
Richmond, California

Dear Ms. Jurist:

Enclosed please find the 2020-2021 Annual Report for the Upland Capping System at the United Heckathorn Superfund Site.

Please feel free to contact me if you have any questions or concerns with the attached report.

Sincerely,

Jim Holland  
Vice President of Facilities, Equipment, and Environmental Officer  
Levin Richmond Terminal Corporation  
(510) 307-4076

Enclosure: 2020-2021 Annual Report for United Heckathorn Superfund Site Upland Capping System



# 2020-2021 Annual Report

**United Heckathorn Superfund Site  
Upland Capping System  
Richmond, California**

September 27, 2021  
Rev. 0

*prepared for:*

**Levin Richmond Terminal Corporation**  
402 Wright Avenue  
Richmond, California 94804

*prepared by:*

**CDIM Engineering, Inc.**  
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San Francisco, California 94102



# 2020-2021 Annual Report

**United Heckathorn Superfund Site  
Upland Capping System  
Richmond, California**

September 27, 2021  
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*prepared by:*

**CDIM Engineering, Inc.**  
45 Polk Street, 3<sup>rd</sup> Floor  
San Francisco, CA 94102

CDIM's work for the Levin Richmond Terminal Corporation was conducted under my supervision. To the best of my knowledge, the data contained herein are true and accurate, are based on what can be reasonably understood as a result of this project, and satisfy the scope of work prescribed by the client for this project. The data, findings, recommendations, specifications, or professional opinions were prepared solely for the use of the Levin Richmond Terminal Corporation in accordance with generally accepted professional engineering and geologic practice. We make no other warranty, either expressed or implied, and are not responsible for the interpretation by others of the contents herein.



A handwritten signature in blue ink that reads "Scott Bourne".

Scott Bourne, PE #C72817  
Principal Engineer

September 27, 2021

Date

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## ACRONYMS AND ABBREVIATIONS

BMP	best management practices
CDIM	CDIM Engineering, Inc.
DDD	dichlorodiphenyldichloroethane
DDE	dichlorodiphenyldichloroethene
DDT	dichlorodiphenyltrichloroethane
EPA	United States Environmental Protection Agency
gpm	gallons per minute
Heckathorn Site or Site	United Heckathorn Superfund Site
IGP	Storm Water Industrial General Permit
LRT	Levin Richmond Terminal
LRTC	Levin Richmond Terminal Corporation
MDL	method detection limit
msl	mean sea level
mS/cm	milliSiemen per centimeter
NAL	numeric action level
NPDES	National Pollutant Discharge Elimination System
O&G	oil and grease
O&M	operations and maintenance
O&M Plan	Revised Draft Operations and Maintenance Plan, Upland Capping System, Former United Heckathorn Site
pg/L	picograms per liter
QSE	Qualified Storm Event
ROD	Record of Decision
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resource Control Board
Third Five-Year Review	Third Five-Year Review Report for United Heckathorn Superfund Site, Richmond, California
TS-2	advanced storm water treatment system TS-2
TSS	total suspended solids

# 1 INTRODUCTION

On behalf of the Levin Richmond Terminal Corporation (LRTC), CDIM Engineering, Inc. (CDIM) has prepared this 2020-2021 Annual Report to describe the inspection, monitoring, and maintenance performed on the upland cap at the United Heckathorn Superfund Site (Heckathorn Site).

## 1.1 Background

From 1947 through 1966, the Heckathorn Site was used for formulating, processing, packaging, and shipping pesticides including aldrin, dichlorodiphenyltrichloroethane (DDT), dieldrin, and endrin. These activities resulted in the release of pesticides to the surrounding soils and the Lauritzen Channel. In 1994, after remedial investigation and feasibility studies were completed, the United States Environmental Protection Agency (EPA) adopted a Record of Decision (ROD) for remedial action requiring:

- Dredging of all soft bay mud from the Lauritzen Channel and the Parr Canal, with offsite disposal of dredged material;
- Placement of clean material after dredging;
- Construction of a cap at and around the former Heckathorn facility to prevent erosion;
- A deed restriction limiting the property at the former Heckathorn facility location to non-residential uses; and,
- Marine monitoring to verify the effectiveness of the remedy (EPA, 1994b).

In 1996, LRTC entered into a Consent Decree<sup>1</sup> with the EPA, which outlined LRTC's responsibility to design, construct, and maintain a concrete cap at and around the former Heckathorn facility to prevent erosion (United States District Court, 1996a). LRTC completed construction of the concrete cap in July 1999 (PES, 1999b).

Since the cap was constructed, EPA has completed four five-year reviews. EPA has found the upland remedial action is functioning as intended, is protective of human health and the environment, and has met the remedial action objective for the upland area by capping of contaminated soils, which has eliminated human exposure pathways and has prevented erosion (EPA, 2016).<sup>2</sup> EPA is scheduled to conduct its fifth five-year review in 2021.

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<sup>1</sup> Montrose Chemical Corporation of California, Chris-Craft Industrial, Rhone-Poulenc, Inc. and Stauffer Management Company (collectively the "Montrose Group") entered into a separate Consent Decree with EPA for dredging of young bay mud from the Lauritzen Channel and Parr Canal, with offsite disposal of dredged material and placement of clean fill after dredging (United States District Court, 1996b).

<sup>2</sup> The 2016 Five Year Review also states (page 34) "*Another remedial action objective is to prevent the erosion and transport or upland soils into the Lauritzen Channel. Erosion is occurring only within the marine area – specifically, under the sheet pile along the Lauritzen Channel embankment; no erosion has been observed in the area of the upland cap. This RAO for the upland area has been met.*" (EPA, 2016).

## 1.2 Program Objectives

To ensure long-term protection of human health and the environment, the remedial action goal established by the EPA for upland and embankment soils is the prevention of erosion and transport into the Lauritzen Channel (EPA, 1994a).

The upland cap was designed to prevent the release of residual chlorinated pesticides that are present in soils (PES, 1998).

The objective of the cap inspection and storm water monitoring programs is to identify any potential release of pesticide-impacted soil by examining the integrity of the cap system through visual inspection and storm water monitoring (EPA, 2011).

## 1.3 Operation and Maintenance Program

LRTC performs operations and maintenance (O&M) activities in accordance with the Revised Draft Operations and Maintenance Plan, Upland Capping System, Former United Heckathorn Site (O&M Plan; PES, 1999a). LRTC performs additional O&M activities as recommended by EPA in the Third Five-Year Review Report for United Heckathorn Superfund Site, Richmond, California (Third Five-Year Review; EPA, 2011) to provide added confidence that the upland area remedy maintains its effectiveness.

## 1.4 Contents of this Report

This Annual Report describes activities performed by LRTC to inspect, monitor and maintain the upland cap for the period of July 1, 2020 to June 30, 2021. Included is a summary of each of the following:

- Capping system maintenance activities;
- Storm water collection system inspection and cleaning;
- Storm water system monitoring;
- Storm water treatment;
- Annual cap inspection;
- Proposed site work for 2021-2022; and,
- A conclusion with CDIM's opinion as to the overall condition and effectiveness of the cap in meeting the program objectives.

## 2 SITE DESCRIPTION

The Levin Richmond Terminal (LRT) is located at 402 Wright Avenue in Richmond, California and is immediately adjacent to the Lauritzen Channel in the Richmond Harbor (Figure 1). The Heckathorn Site includes the northern five acres of the Main Terminal at LRT, also known as the upland cap area (Figure 2).

### 2.1 Upland Area Description and Current Use

The upland cap area is bounded by a railroad track and Cutting Boulevard to the north; South Fourth Street to the east; the LRT and Santa Fe Channel to the south; and the Lauritzen Channel to the west. The majority of the upland cap area is relatively flat with surface elevations of approximately 9 feet above mean sea level (msl), with the exception of the upland cap area north of the Lauritzen Channel; this portion was raised to approximately 15 feet above msl during cap construction.

The upland cap area is used primarily for storage of dry bulk product and railroad operations. Photographs taken during the site inspection are included in Appendix A.

### 2.2 Nearby Water Bodies

The storm water system in the upland cap area discharges directly to the Lauritzen Channel (Figure 2). The Lauritzen Channel is connected to the San Francisco Bay via the Santa Fe Channel and Richmond Inner Harbor.

### 2.3 Upland Area Cap

Construction of the concrete cap at the upland cap area began in July 1998, and it was completed in July 1999 (PES, 1999b). Installation of the cap consisted of: (1) site grading to promote surface runoff to the collection points; (2) installation of a drainage system to collect surface runoff, including best management practices (BMPs) for storm water pollution prevention; and (3) construction of a reinforced concrete cap in the majority of the 5-acre area and construction of a geotextile fabric and gravel cap in the railroad track area (Figure 2). The concrete cap consists of a minimum 6-inch thick concrete section with a double layer of welded wire fabric reinforcement. The gravel cover consists of a geotextile fabric over a prepared subgrade. The geotextile fabric is covered by a 6-inch layer of gravel.

### 2.4 Storm Water Collection and Advanced Treatment

The facility is paved with asphalt and concrete and is graded to direct surface water runoff via sheet flow or shallow swales to drop inlets (Figure 3). The drop inlets drain to five below-grade interceptors<sup>3</sup> (SW-3 through SW-7) via underground pipe. The interceptors are equipped with compartments and steel baffles to allow the

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<sup>3</sup> The interceptor design was based on a five-minute retention time during a 10-year, 24-hour storm event (PES, 1999a).

settling of sediments and separation of oil/grease and floatables. Each interceptor is also equipped with normally-closed gate valves at the effluent pipe, which can be opened during heavy rains to enable direct discharge to the Lauritzen Channel.

In 2015, LRTC modified<sup>4</sup> the upland cap area storm water collection system and installed an advanced storm water treatment system TS-2 (TS-2). Single-speed submersible pumps placed into the final chamber of each interceptor were connected to newly installed storm drain pipe along the edge of the LRTC pier. During storm events, the submersible pumps push storm water captured by interceptors SW-3 to SW-7 through an inline static mixer where a biopolymer flocculant is added. Storm water then flows into a series of two 21,000-gallon aboveground clarification tanks, where flocculant and solids separate from the water. Storm water overflows from the second clarifier and is pumped through four, 48-inch diameter sand filters. Effluent from the treatment system then is discharged to the Lauritzen Channel at the interceptor SW-5 outfall. TS-2 is equipped with a variable speed drive for pump control, a programmable logic controller, and a human machine interface.

The estimated flow for the SW-3 to SW-7 catchments that results from a 0.2 inch per hour design storm intensity<sup>5</sup> is approximately 500 gallons per minute (gpm). TS-2 is designed to treat approximately 650 gpm. Additionally, due to the storage volume provided by interceptors and clarifiers, the system is able to capture and treat periods of storm water flow in excess of 650 gpm before treatment bypass occurs.

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<sup>4</sup> The storm water treatment system was described in the 2014-2015 annual report and a telephone conversation (December 26, 2014) and email correspondence (January 26, 2016) between Rachelle Thompson of EPA and Scott Bourne (formerly of Weiss Associates).

<sup>5</sup> Design criteria for flow-based treatment established in Industrial General Permit (IGP) (SWRCB, 2014).

### 3 OPERATION AND MAINTENANCE

This section describes the operation and maintenance activities performed by LRTC for the upland cap at the Heckathorn Site during the 2020-2021 reporting year. These activities included:

- Upland cap maintenance;
- Storm water collection system inspection and cleaning;
- Storm water monitoring; and
- Storm water treatment and operation.

#### 3.1 Upland Cap Maintenance

During the 2020-2021 reporting year, LRTC monitored the performance of the concrete cap and gravel cover in accordance with recommendations contained in the 2019-2020 Annual Report (CDIM, 2020a). LRTC regularly monitored the cap and inspected cracks, seals, and joints for signs of propagation and/or degradation. No evidence of exposed underlying soil was observed. The upland cap functioned as designed, and no major maintenance or repair of the cap was conducted during the current reporting period.

#### 3.2 Storm Water Collection System Inspection and Cleaning

LRTC inspected the storm drain inlets, interceptors, and clarifier tanks prior to the 2020-2021 rainy season and monthly throughout the reporting year per its Storm Water Pollution Prevention Plan (SWPPP; CDIM, 2020b). Storm water interceptors and the clarifier tanks were cleaned before the start of the rainy season. Drain inlets and inlet filters were cleaned and replaced as needed throughout the year.

#### 3.3 Storm Water Monitoring

The objective of the storm water monitoring program is to verify the cap is effectively preventing erosion, reducing the potential for storm water contact with soils containing residual pesticides and reducing the potential for release of residual pesticides to the Lauritzen Channel. This section describes the storm water sampling, results, and quality assurance/quality control procedures. It also includes an assessment of the results.

##### 3.3.1 Storm Water Sampling

LRTC sampled industrial storm water discharges in accordance with State Water Resources Control Board (SWRCB) Water Quality Order No. 2014-0057-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000001, *General Permit for Storm Water Discharges Associated with Industrial Activities* (IGP; SWRCB, 2014) and the O&M Plan (PES, 1999a). Storm water monitoring requirements are documented in LRTC's SWPPP.

Prior to 2015, LRTC collected samples from interceptors SW-3 through SW-7. Since installing advanced treatment system TS-2, LRTC no longer regularly discharges storm water at these locations. As a result, LRTC



now collects storm water samples from the TS-2 influent and effluent.<sup>6</sup> In the event that elevated pesticides are detected in the TS-2 influent or effluent, LRTC is prepared to sample at interceptors SW-3 through SW-7.

Storm water samples were submitted to Vista Analytical in El Dorado Hills, California for pesticide analysis by EPA Method 1699. Storm water samples were submitted to Pace Analytical National Laboratories in Mount Juliet, Tennessee for the following analyses: pH by Standard Method 4500HB, total suspended solids (TSS) by Standard Method 2540D, oil and grease (O&G) by EPA 1644A, and metals by EPA Method 200.8. Laboratory reports, including applicable chain-of-custody forms, are included in Appendix B.<sup>7</sup>

### 3.3.2 Sample Results

During the 2020-2021 reporting year, storm water from the combined TS-2 influent and effluent was sampled during two storm events: December 13, 2020 and January 22, 2021.<sup>8</sup>

#### 3.3.2.1 Effluent Sample Results

Tables 1 and 2 show laboratory analytical results for pesticides and general parameters/metals, respectively. Pesticides were detected in the treated storm water discharge samples (TS2-E) from each of the storm events sampled during the 2020-2021 reporting year. In the effluent samples from the December 13, 2020 and January 22, 2021 sampling events, total DDT<sup>9</sup> was detected at concentrations of 695 and 438 picograms per liter (pg/L), and dieldrin was detected at concentrations of 564 and 540 pg/L. TS-2 discharge results for all other pollutants (metals, O&G, pH and TSS) were below the numeric action levels (NALs; State Water Resources Control Board, 2014) during the 2020-2021 reporting year.

#### 3.3.2.2 Influent Sample Results

Samples of the combined influent to TS-2 (TS2-I) were collected during two storm events. Influent samples were composited using the SW-3, SW-4, and the combined SW-5/6/7 influent feeds; volume from each feed was calculated based on the estimated runoff contribution to TS-2 discharge. Total DDT was detected in the influent samples from the December 13, 2020 and January 22, 2021 sampling events at concentrations of 25,123 pg/L and 21,777 pg/L respectively. Dieldrin was detected in the influent samples from the December 13, 2020 and January 22, 2021 sampling events at concentrations of 1,820 pg/L and 1,270 pg/L respectively.

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<sup>6</sup> Changes to storm water monitoring was discussed during a telephone conversation on November 3, 2015 between Rachelle Thompson of EPA and Scott Bourne (formerly) of Weiss Associates.

<sup>7</sup> Laboratory analytical reports include data for LRT storm water discharge points that are not located in the upland cap area (TS1-E, TS3-E, TS4-E).

<sup>8</sup> LRTC is eligible for and has elected to implement a Sampling Frequency Reduction under the IGP. Beginning in January 2020 and until such a time when LRTC is no longer eligible, or if requested by EPA, storm water sampling will be performed twice per reporting year.

<sup>9</sup> Total DDT represents the sum of detected concentrations of 4,4' and 2,4'- isomers of DDT, DDD, and DDE and/or the detection limits for non-detected compounds.

### 3.3.3 Quality Assurance/Quality Control

The O&M Plan stipulates that at least one duplicate sample be collected for analysis by EPA Method 8080 per storm sampling event. However, due to the change to EPA Method 1699, it was determined that a duplicate pesticide sample was no longer necessary. EPA Method 1699 employs high-resolution gas chromatography/high-resolution mass spectrometry with isotope dilution and internal standard quantification techniques to provide improved sensitivity and data quality. In future years, a duplicate sample can be collected upon EPA request.

Laboratory method detection limits (MDLs) for each DDT isomer, and the sum of the MDLs for all DDT isomers, were below the total DDT final surface water remediation level of 590 pg/L established in the ROD (EPA, 1994b) for all events, with the exception of the December 13, 2020 event. The MDL for dieldrin was below the final surface water remediation level of 140 pg/L.

The laboratory reported high interference levels in both the influent and effluent samples collected on December 13, 2020, causing the sample to require extraction using a lesser volume. The decreased volume caused an increase in the method detection and reporting limits, which could bias the calculated effluent total DDT high. No other data quality issues were reported through the data validation process. Based on the data validation process, the data resulting from sampling and analysis are acceptable and complete.

### 3.3.4 Assessment of Results

Pesticides were detected in all TS-2 influent and effluent samples during the 2020-2021 reporting year. Total DDT was detected in one of the two effluent samples at concentrations above the surface water remediation level of 590 pg/L, likely due to elevated method detection limits reported during this event. Dieldrin was detected in both effluent samples at concentrations above the surface water remediation level of 140 pg/L. Figures 4 and 5 present trend charts showing influent and effluent DDT and dieldrin concentrations from October 2015 to present,<sup>10</sup> including detected concentrations and MDLs when pesticides were not detected.<sup>11</sup> Sample results from the 2020-2021 reporting year show that TS-2 is effective at reducing concentrations of total DDT, dieldrin, TSS and metals. While concentrations exhibit a relatively high degree of variability between the years 2016-2019, both influent and effluent concentrations generally show less variability and a downward trend following 2019.

## 3.4 Storm Water Treatment System Operation

LRT received approximately 8.17 inches of rainfall<sup>12</sup> during the 2020-2021 reporting period. According to the LRTC, TS-2 provided sufficient treatment capacity to prevent treatment system bypass for all time periods when its operation was observed. No significant operation and maintenance concerns were encountered.

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<sup>10</sup> Concentration trend charts for DDT and dieldrin for individual storm water discharge locations from 2011 to 2015 are contained in the 2014-2015 Annual Report (Weiss, 2015).

<sup>11</sup> Denoted by "<n", where *n* is MDL, if available, or reporting limit otherwise.

<sup>12</sup> Rainfall from LRTC rain gauge.

## 4 ANNUAL SITE INSPECTION

Representatives of LRTC and CDIM inspected the upland cap on May 5, 2021 and the shoreline on May 28, 2021. The inspections included visual observations of the concrete cap, gravel cover, and drainage system throughout the observable extent of the upland cap area and inspection of the shoreline in the tidal zone during a very low tide event. Appendix A includes photographs taken during the inspections. Figure 3 shows the locations of the photographs. Appendix D includes the inspection form.

### 4.1 Concrete Cap Inspection

Visual inspections concentrated on identifying signs of deterioration and exposure of the underlying subgrade at cracks, joints, high-loading areas, gravel and cap penetrations. Areas identified in the Fourth Five-Year Review (EPA, 2016) and the 2019-2020 Annual Report (CDIM, 2020a) with cracks and potential settlement were reexamined.

- **SW-3 Area** – Minor surficial cracks and seams were noted in the paved SW-3 Area (Appendix A; Photos 1, 2 and 3).
- **SW-4 Area** – Minor surficial cracks and seams were observed in the bulk product storage area (Appendix A; Photos 3, 4, 5 and 6).
- **SW-5 Area** – Minor surficial cracks and seams were observed in the SW-5 Area, and previous repairs remain in good condition (Appendix A; Photos 7 and 8).
- **SW-6 Area** – Concrete appeared in good condition in the SW-6 Area (Appendix A; Photo 9). Minor surficial cracks, typical of aged concrete with no underlying soil exposed. Shotcrete installed along the Lauritzen Channel appeared to be in good condition (Appendix A; Photo 10).
- **SW-7 Area** – Minor surficial cracks were observed in the SW-7 area (Appendix A; Photos 11 and 12). Seams appeared in good condition. Shotcrete applied to the northern shoreline of the Lauritzen Channel appeared to be in good condition (Appendix A; Photo 13).

No evidence of differential settling or vertical displacement was observed across the cap. No evidence of cracks, gaps, significant cap deterioration, or other material breach with apparent potential for exposure of the underlying subgrade was observed during the inspection. CDIM recommends that LRTC continue to monitor the cap for signs of deterioration.

### 4.2 Gravel Cover Inspection

Visual observations of the gravel cover concentrated on identifying areas where the gravel cover was thin. A geotextile membrane underlies the gravel cover, but it was not visually observed in any of the areas inspected. Below is a summary of observations from the concrete cap inspection.

- **SW-3 Area** – The gravel cover appeared adequate; the underlying geotextile fabric was not exposed in any area (Appendix A; Photo 14).
- **SW-4 Area** – The gravel cover appeared adequate; the underlying geotextile fabric was not exposed in any area (Appendix A; Photo 15 and 16).

- **SW-5 Area** – The gravel cover appeared adequate; the underlying geotextile fabric was not exposed in any area (Appendix A; Photos 17 and 18).
- **SW-6 Area** – The gravel cover appeared adequate; the underlying geotextile fabric was not exposed in any area (Appendix A; Photos 19 and 20).

No visual evidence of differential settling or vertical displacement was observed. Overall, the gravel cover was found to be in good condition and functioning properly with no apparent potential for exposure of the underlying subgrade. CDIM recommends that LRTC continue to regularly inspect the gravel cover and to perform maintenance as detailed in Section 5.

### 4.3 Shoreline Inspection

In accordance with recommendations contained in 2019-2020 Annual Report (CDIM, 2020a), LRTC inspected the shoreline of the Lauritzen Canal along the Site for water seepage. CDIM and LRTC visually observed the shoreline on May 28, 2021 during a very low tide<sup>13</sup>. CDIM observed two areas of apparent seepage: one location directly west of Rail Switch #132 (approximately Bent # -41) (Appendix A, Photo 21); and another location approximately 20 feet southeast of the City of Richmond (City) municipal outfall (approximately Bent # -49) (Appendix A, Photo 22). Figure 3 shows both locations. Water seepage emerged from the shoreline at elevations of between approximately -1.5 and +2 feet relative to mean lower low water, or at the very lowest end of the tidal range. CDIM collected three electrical conductivity readings at each of the two seep locations as well as a background sample from Bay water. Electrical conductivity at the seep location west of Rail Switch #132 (13.1, 14.8 and 13.2 milliSiemens per centimeter [mS/cm]) was consistent with the background samples from the Bay (13.2, 11.5 and 11.5 mS/cm). Electrical conductivity at the location southeast of the City's municipal outfall (1.7, 1.6, and 1.7 mS/cm) was below background samples from the Bay but significantly higher than would be expected for a potable water source. Water discharge was evident at the City's nearby municipal storm water outfall during the shoreline inspection. Based on the field observations of the shoreline and associated upland area, it appears that the seepage near Bent #-41 was tidal water, and the seepage at the municipal outfall was some combination of: tidal water, discharge from the outfall and/or groundwater. Field notes for the event, including electric conductivity readings, are included in Appendix C.

### 4.4 Irrigation Box Inspection

In accordance with the 2019-2020 Annual Report (CDIM, 2020a), LRTC performed regular inspections of irrigation boxes along Fourth Street and in other locations near the upland cap as part of their regular site inspections. No evidence of leakage at any irrigation boxes was observed.

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<sup>13</sup> CDIM inspected the shoreline between 8:00 AM and 10:00 AM on May 28, 2021; low tide for the Richmond Inner Harbor (NOAA Station #9414863) was -2.0 feet mean lower low water at 8:00 AM.

## 5 PROPOSED SITE WORK FOR 2021-2022

During the 2021-2022 reporting year, the following O&M activities are proposed:

- Storm water discharge samples will be collected from the TS-2 treatment system effluent (combined SW-3 through SW-7) discharge location. TS-2 influent samples will also be collected to evaluate system effectiveness.
- Regular inspections of the upland capping system, including the drainage system, will continue as part of the SWPPP (CDIM, 2020b) compliance activities and daily operations.
- Routine inspection of irrigation boxes and other irrigation features will be performed as part of environmental inspection programs.
- Periodic visual inspection of the shoreline during low tide events for evidence of seepage.
- An annual inspection of the concrete cap and gravel cover in the upland cap area will be performed in the early summer of 2022.
- As needed, significant cracks will be filled, and deteriorated sections of concrete in the upland capping system will be replaced.

Proposed site work under the O&M Plan for 2021-2022 is presented in Table 3.

Any repairs to the cap, if required, will be documented and reported in a memorandum to the EPA and the California Department of Toxic Substances Control.

## 6 CONCLUSIONS AND RECOMMENDATIONS

The annual upland capping system inspection found that the surface cap is in overall good condition, and it effectively functions to prevent erosion of the underlying soil. Storm water sampling results from the upland cap area indicate that treatment system TS-2 is effective in reducing the discharge of pesticides.

No areas of the upland cap requiring maintenance were identified in the Annual Site Inspection. As a result, CDIM recommends continuing the following ongoing general maintenance and monitoring activities:

- Continue to monitor gravel cover areas and add gravel as needed;
- As needed, fill any significant cracks, and replace deteriorated sections of concrete in the upland capping system;
- Continue regular inspections and BMPs identified in LRTC's SWPPP (CDIM, 2020b);
- Continue regular inspection of irrigation boxes and other irrigation features to identify leakage and conduct repairs; and,
- Continue to monitor storm water for pesticides as described herein.

## 7 REFERENCES

- CDIM Engineering (CDIM), 2020a. 2019-2020 Annual Report for United Heckathorn Superfund Site, Upland Capping System, Richmond, California, September 8.
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- \_\_\_\_\_, 1994b. EPA Superfund Record of Decision: United Heckathorn Co., EPA ID: CAD981436363; OU 01, Richmond, CA, EPA/ROD/R09-96/5021996, October.
- \_\_\_\_\_, 2011. Third Five-Year Review Report for United Heckathorn Superfund Site, Richmond, California, September.
- \_\_\_\_\_, 2016. Fourth Five-Year Review Report for United Heckathorn Superfund Site, Richmond, California, August.
- Weiss Associates, 2014. 2013-2014 Annual Report for the United Heckathorn Superfund Site, Upland Capping System, Richmond, California, July 15.
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## **TABLES**



Table 1. 2020-2021 Annual Storm Water Sampling Data for Pesticides

Discharge Location	Analytical results <sup>a</sup>																										
	2,4'-DDD	4,4'-DDD	2,4'-DDE	4,4'-DDE	2,4'-DDT	4,4'-DDT	Total DDT	Aldrin	alpha-BHC	alpha-Chlordane	beta-BHC	cis-Nonachlor	delta-BHC	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulfate	Endrin	Endrin aldehyde	gamma-Chlordane	Heptachlor	Heptachlor epoxide <sup>e</sup>	Hexachlorobenzene	Methoxychlor	Mirex	Oxychlordane	trans-Nonachlor
INFLUENT																											
TS2-I <sup>b</sup>																											
12/13/2020	1,660	3,220	303 J	3,730	1,410	14,800	25,123	<112	<114	1,100	<127	<106	<116	1,820	<1710	<1600	<1430	967	<1340	780	<74.1	<264	5,350 B	<1570	<116	<112	552
1/22/2021	2,170	2,840	457	4020 H	3,030	9,260	21,777	7.63 J	64.6	351	49.9	<11.8	<12.8	1,270	<189	<176	<158	387 H	<148 H	432	<8.19	210	2,080 B	<173	<12.8	<12.4	228 H
EFFLUENT																											
TS2-E <sup>c</sup>																											
12/13/2020	<98.9	<136	<70.2	115 J	<134	<141	695	<94.3	76.2 J	<147	<107	<89.7	<97.4	564	126 J	<1340	<1210	166 J	<1130	<92.8	<62.5	<222	143 J, B	<1320	<97.4	<94.3	<152
1/22/2021	65.0	84.1	10.2 J	96.1	55.0	128	438	<12.0	39.3	39.7	50.0	<11.4	<12.4	540	<184	<171	<153	152	<144	24.4 J	<7.95	266	52.4 B	<168 H	<12.4	<12.0	19.4 J
Remediation Goal <sup>d</sup>							590					140															

**Notes:**  
All units in picograms per liter (pg/L).  
Detected concentrations of pesticides are displayed in **bold**.  
<sup>a</sup> Laboratory method EPA 1699.  
<sup>b</sup> TS2-I is the combined influent from interceptors SW-3 to SW-7 and does not represent discharge. It is used to evaluate TS-2 effectiveness.  
<sup>c</sup> TS2-E is the effluent of treatment system TS-2, which treats storm water from interceptors SW-3 to SW-7. It represents facility discharge.  
<sup>d</sup> Remediation goal from USEPA Superfund Record of Decision: United Heckathorn Co., October 1994, for surface waters in the Lauritzen, Santa Fe,  
<sup>e</sup> Reported result is sum of detected cis- and trans-heptachlor epoxide concentrations.

**Acronyms/Abbreviations:**  
< n =not detected above the sample-specific estimated detection limit      pg/L = picograms per liter  
B = compound was also detected in laboratory method blank      USEPA = United States Environmental Protection Agency  
J = concentration reported is an estimated value      H = recovery below acceptabl emethod limit, reported results may be biased low

Table 2. 2020-2021 Annual Storm Water Sampling Data for General Parameters and Metals

Discharge Location	Notes	Analytical Parameters <sup>a</sup>							
		pH	O&G (HEM)	TSS	Aluminum	Iron	Lead	Zinc	
		-	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	
INFLUENT									
TS2-I <sup>b</sup>									
12/13/2020		7.34	5.50	686	J3	837	3,490	14.0	184
1/22/2021		7.56	2.60	J 124	495	1,620	9.63		157
EFFLUENT									
TS2-E <sup>c</sup>									
12/13/2020		7.24	<5.21	5.9	<100	72.2	J 0.658	J	73.5
1/22/2021		7.84	<5.56	2.3	J <100	55.9	J 1.46	J	120
2014 IGP Numeric Action Levels (NALs) <sup>d</sup>		6.0-9.0 <sup>e</sup>	15	100	750	1,000	262		260

**Notes:**

**Bold** values exceed 2014 IGP NALs listed at the bottom of the table.

<sup>a</sup> Laboratory Methods: pH by SM4500HB; TSS by SM2540D, O&G by EPA 1664A; metals by EPA 200.8.

<sup>b</sup> TS2-I is the combined influent from interceptors SW-3 to SW-7 and does not represent discharge. It is used to evaluate TS-2 effectiveness.

<sup>c</sup> TS2-E is the effluent of treatment system TS-2, which treats storm water from interceptors SW-3 to SW-7.

<sup>d</sup> Numeric Action Level (NAL) in 2014 General Permit for Storm Water Discharges Associated with Industrial Activities (2014 IGP).

**Acronyms/Abbreviations:**

< n = not detected above the detection limit

B = analyte was present in the associated method blank

EPA = Environmental Protection Agency

IGP = Industrial General Permit

J = concentration reported is an estimated value

mg/L = milligrams per liter

NAL = numeric action level

O&G HEM = oil and grease, hexane extractable material

TSS = total suspended solids

ug/L = micrograms per liter

Table 3. Proposed Site Work for 2020-2021, Levin Richmond Terminal Corporation

Aspect	Description	Anticipated Completion Date
General	Implement activities (i.e., cap maintenance, storm water monitoring, interceptor cleanout, irrigation feature inspection) described in the O&M Plan. <sup>1</sup>	Continuously
	Submit report of O&M performed for the period of July 1, 2020 to June 30, 2021.	On/around August 15, 2022
Concrete Cap	Perform 2020-2021 annual inspection of the cap under oversight of a registered engineer.	June 1, 2022
	Monitor identified cracks, seals, and joints for signs of propagation and/or degradation throughout upland capping system.	Continuously
Gravel Cover	Monitor the gravel cover throughout the Upland Area for signs of thinning or ground exposure.	Continuously
Storm Water System	Continue to treat combined storm water pumped from interceptors SW-3, SW-4, SW-5, SW-6, and SW-7 at treatment system TS-2 using flocculation, settling, and filtration methods.	Continuously
Shoreline	Conduct an annual inspection of the shoreline along the Lauritzen Channel ending at the municipal outfall at low tide and note any observed seepage.	On/around May 15, 2022
Irrigation Boxes/ Utilities	Conduct periodic visual inspections of ground surface adjacent to irrigation boxes and other utility boxes for evidence of a water leak.	Periodically

1. *Revised Draft Operations and Maintenance Plan, Upland Capping System, Former United Heckathorn Site*, PES Environmental, Inc., March 1999.



## FIGURES

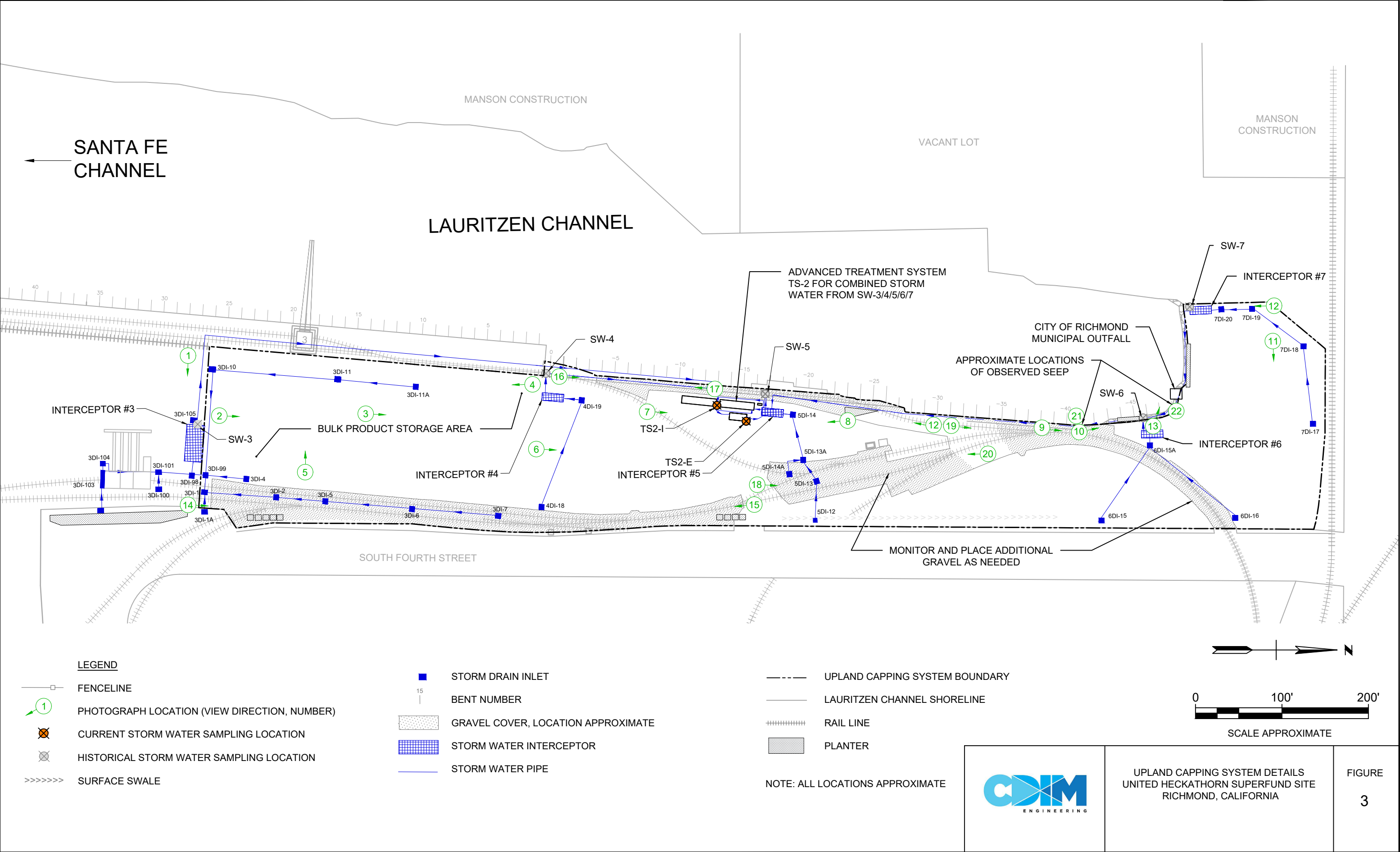


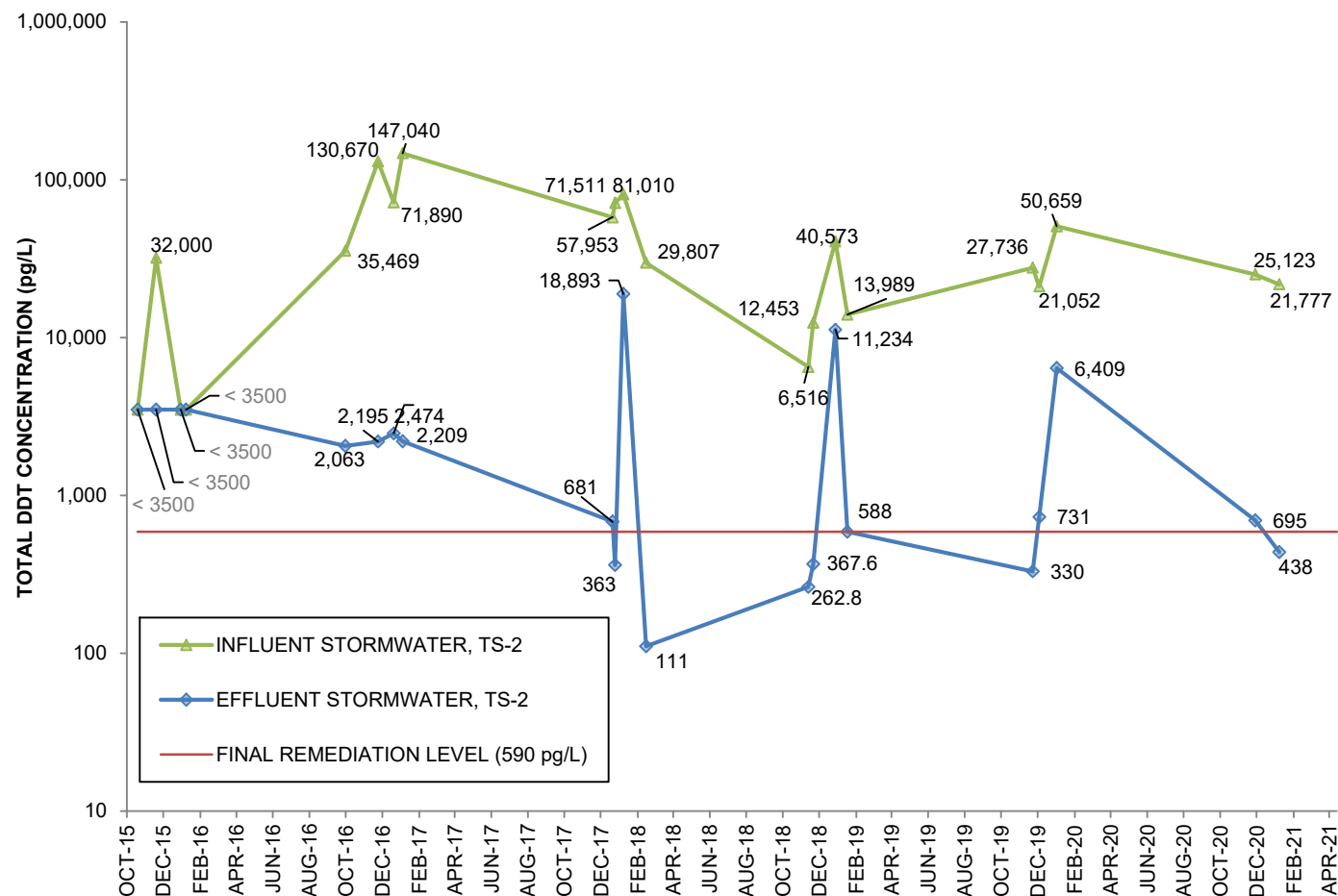












**NOTES:**

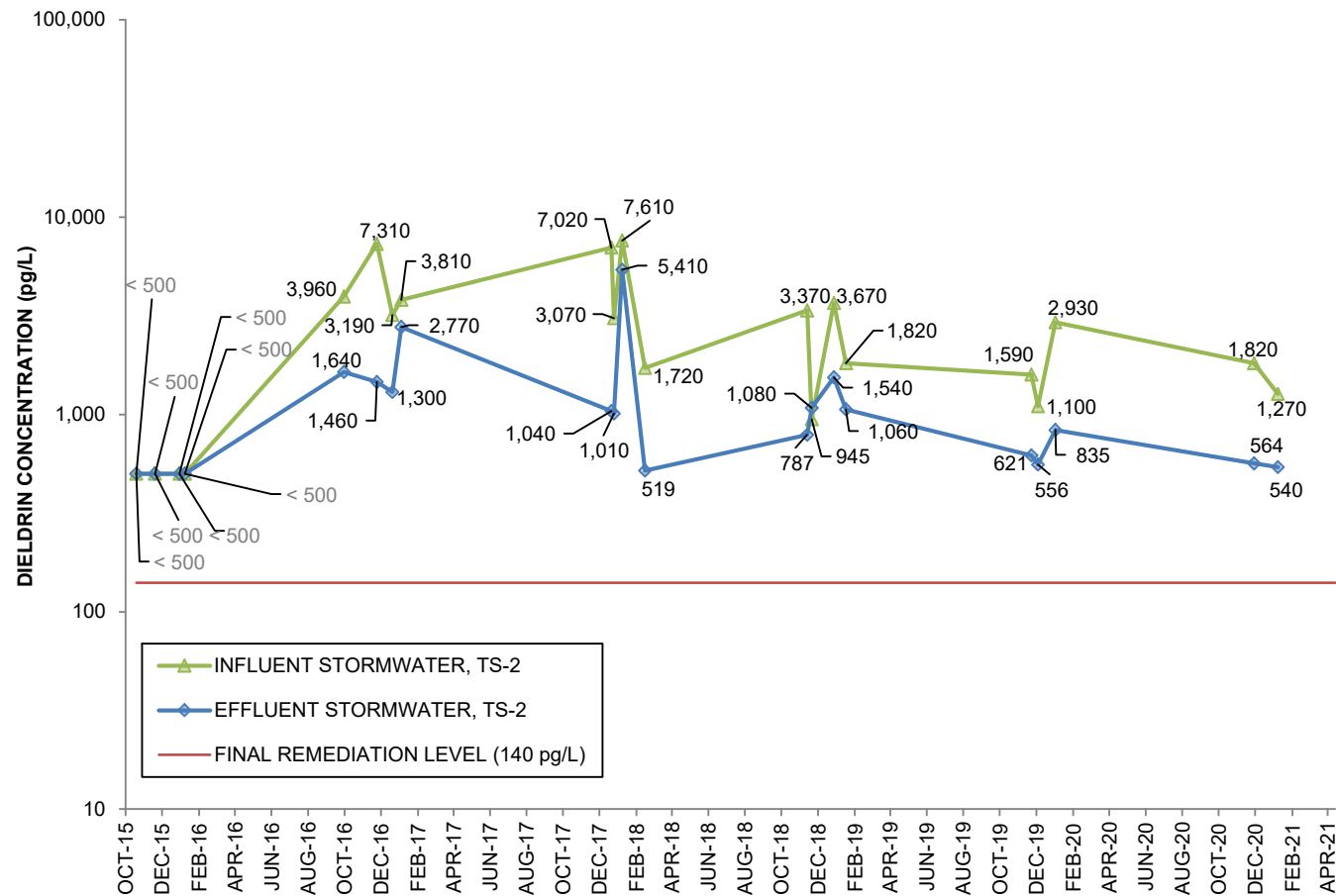
1. TOTAL DDT REPRESENTS THE SUM OF DETECTED DDT, DDD, AND DDE CONCENTRATIONS AND/OR DETECTION LIMITS FOR NON-DETECTED COMPOUNDS (DENOTED BY < N).
2. RESULTS REPORTED IN pg/L



45 POLK STREET, THIRD FLOOR  
SAN FRANCISCO, CA 94102  
WWW.CDIMENGINEERING.COM  
PH: (415) 498-0535

TOTAL DDT IN STORMWATER, 2015-2021  
TREATMENT SYSTEM TS-2  
UNITED HECKATHORN SUPERFUND SITE  
UPLAND CAPPING SYSTEM  
RICHMOND, CALIFORNIA

FIGURE  
4



**NOTES:**

1. RESULTS REPORTED IN pg/L



45 POLK STREET, THIRD FLOOR  
 SAN FRANCISCO, CA 94102  
 WWW.CDIMENGINEERING.COM  
 PH: (415) 498-0535

DIELDRIN IN STORMWATER, 2015-2021  
 TREATMENT SYSTEM TS-2  
 UNITED HECKATHORN SUPERFUND SITE  
 UPLAND CAPPING SYSTEM  
 RICHMOND, CALIFORNIA

FIGURE

5



## **APPENDIX A**

### Upland Capping System Inspection Photographs



Photo 1 – Drain inlet 3DI-105 (under rubber cover) and interceptor SW-3 where piping modifications were made during the 2019-2020 reporting year. Minor surficial cracking noted in the area.

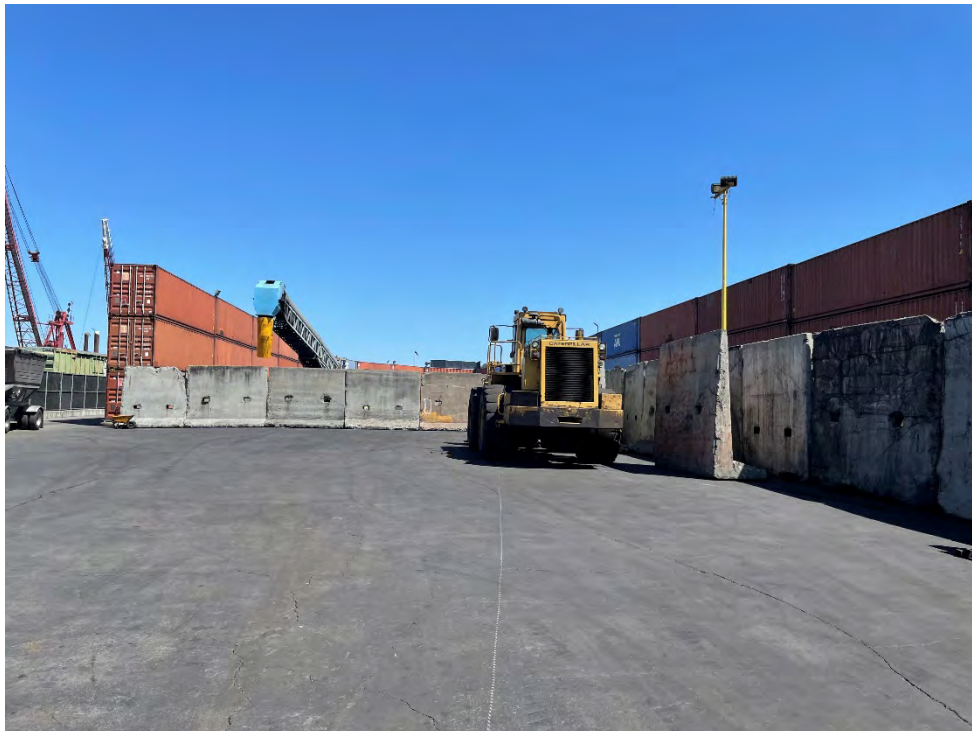


Photo 2 – View of SW-3 drainage area looking north toward the secondary bulk product storage area. Minor surficial cracking visible.





Photo 3 – Looking north from the SW-3 drainage area toward the SW-4 drainage area, within the secondary bulk product storage area. Minor surficial cracking is visible throughout the area.

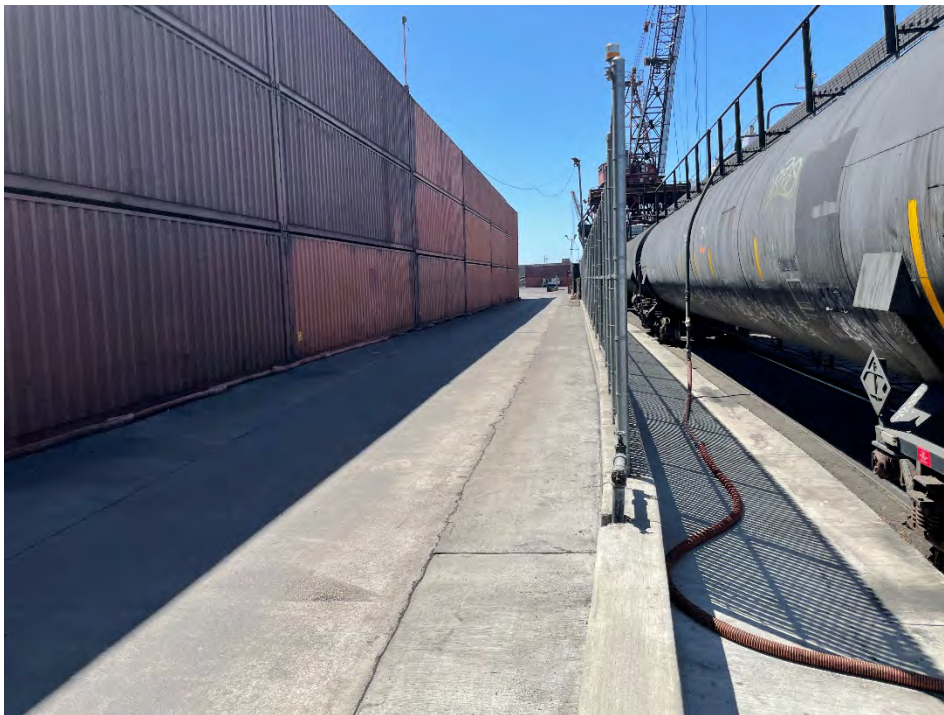


Photo 4 – Looking south from SW-4 toward SW-3, adjacent to Lauritzen Channel. Concrete seams appear in good condition.





Photo 5 – Looking west at seam in the concrete within the secondary bulk product storage area (SW-4). Over laying concrete appears to be slightly deteriorated.



Photo 6 – Looking north in the northern portion of the secondary bulk product storage area (SW-4). Seams and surficial cracking are visible.





Photo 7 – Looking north toward TS-2 (SW-5 area), Seams between asphalt on railroad tracks and concrete appear to be in good condition.

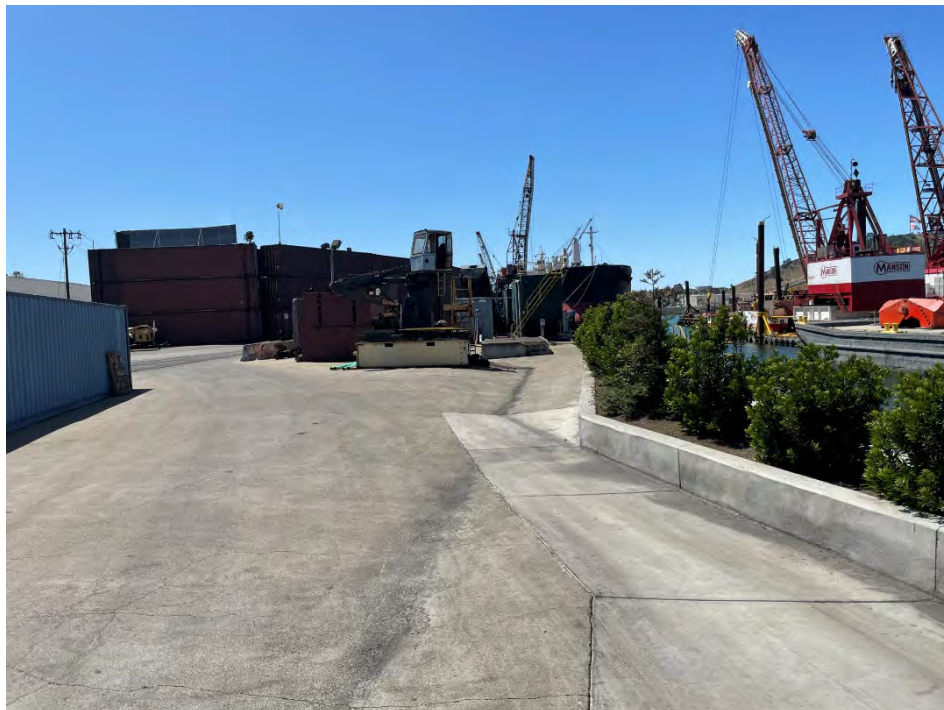


Photo 8 – Looking south toward TS-2 (SW-5 area), no significant cracks or deterioration noted in the area.



Photo 9 – Looking north toward SW-6. No significant cracks or deterioration noted in the area. Gravel cover along railroad tracks appears adequate, with no underlying geotextile exposed.

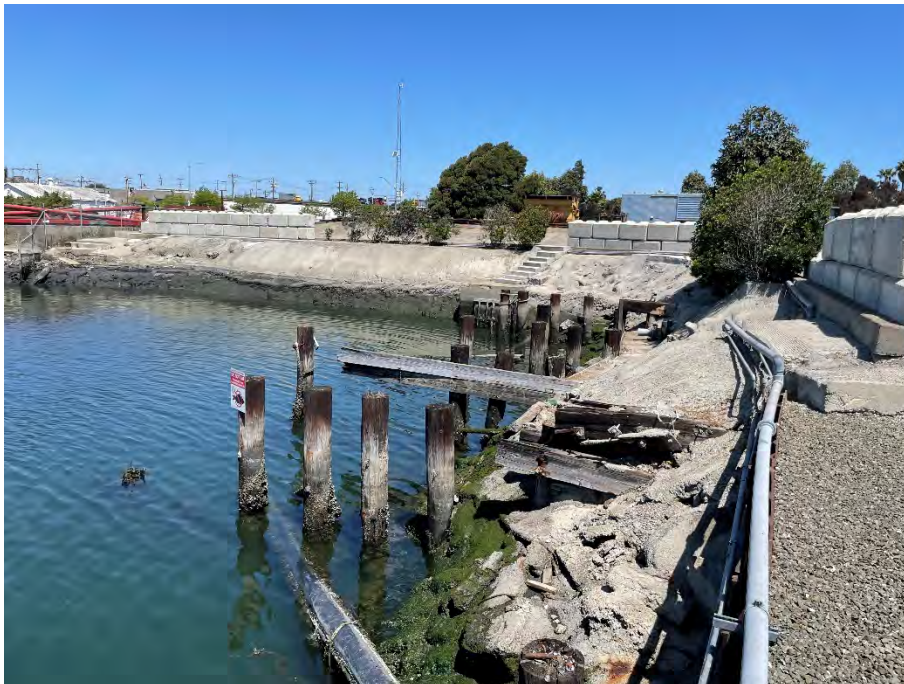


Photo 10 – Looking toward the municipal outfall at the end of the Lauritzen Channel. Shotcrete installed along the Channel edge appears to be in good condition.





Photo 11 – Looking east at concrete cap north of the Lauritzen Channel. No significant cracks or deterioration noted in the area.



Photo 12 – Looking west toward the municipal outfall, at the north end of the Lauritzen Channel. Shotcrete has been applied to stabilize the area along the shoreline.





Photo 13 –Looking northwest toward the municipal outfall, at the north end of the Lauritzen Channel. Shotcrete applied to stabilize the area along the shoreline appears to be in good condition.



Photo 14 – Looking north along South Fourth Street in SW-3 area. Gravel cover in good condition with no geotextile exposed.





Photo 15 – Looking south along South Fourth Street in SW-4 area. Gravel cover in good condition with no geotextile exposed.



Photo 16 – Looking north along the Lauritzen Channel in SW-4 area. Gravel cover in good condition with no geotextile exposed.





Photo 17 – Looking south along the Lauritzen Channel, adjacent to Treatment System 2, in the SW-5 area. Gravel cover in good condition with no geotextile exposed.

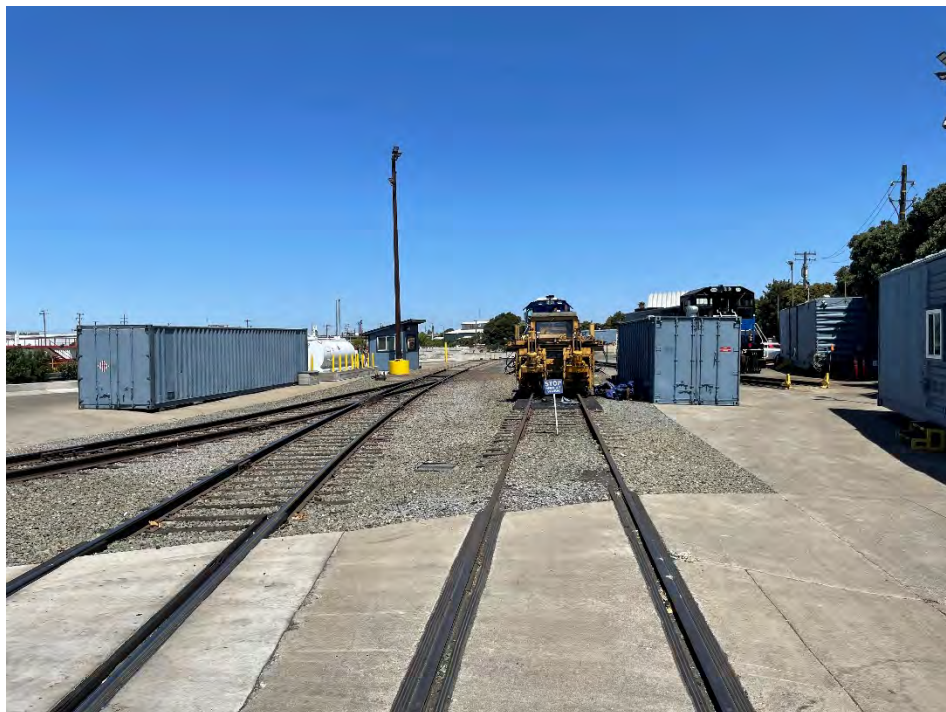


Photo 18 – Looking north toward the railroad maintenance area in SW-5. Gravel cover in good condition with no geotextile exposed.



Photo 19 – Looking north along the Lauritzen Channel toward interceptor SW-6. Gravel cover in good condition with no geotextile exposed.



Photo 20 – Looking south toward interceptor SW-6 drainage area. Gravel cover in good condition with no geotextile exposed.





Photo 21 – Looking southeast at sheet piling along the edge of Lauritzen Channel, at Bent # -41. Arrow is marking seep location observed during shoreline inspection on May 28, 2021.



Photo 22 – Looking northwest toward the municipal outflow at the end of the Lauritzen Channel, at Bent # -49. Arrow is marking seep location observed during shoreline inspection on May 28, 2021.





## **APPENDIX B**

### Laboratory Analytical Reports



February 09, 2021

**Vista Work Order No. 2002712**

Mr. Bryan Starks  
CDIM Engineering  
45 Polk Street, 3rd Floor  
San Francisco, CA 94102

Dear Mr. Starks,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on December 15, 2020 under your Project Name 'LRTC Industrial Stormwater'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at [mmaier@vista-analytical.com](mailto:mmaier@vista-analytical.com).

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

A handwritten signature in black ink that reads "Martha Maier".

Martha Maier  
Laboratory Director



*Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.*

**Vista Work Order No. 2002712****Case Narrative****Sample Condition on Receipt:**

One water sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology. The sample was received in good condition and within the method temperature requirements. The collection time for the sample was listed as “1000” on the container label.

**Analytical Notes:****EPA Method 1699**

The three bottles of the sample were composited prior to an aliquot taken for extraction and analyzed for chlorinated pesticides by EPA Method 1699 using a ZB-50 GC column.

**Holding Times**

The sample was originally extracted within the method hold time. The sample was re-extracted past the method hold time and analyzed within the method hold time.

**Quality Control**

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected above the sample quantitation limits in the Method Blank. The OPR recoveries were within the method acceptance criteria.

Labeled standard recoveries for all QC and field samples were within method acceptance criteria.

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# Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2002712-01	TS2-I-201213	13-Dec-20 09:40	15-Dec-20 11:13	Amber Glass NM Bottle, 1L Amber Glass NM Bottle, 1L Amber Glass NM Bottle, 1L

## **ANALYTICAL RESULTS**

Client Data		Laboratory Data			
Name:	CDIM Engineering	Lab Sample:	B1A0122-BLK1		
Project:	LRTC Industrial Stormwater	QC Batch:	B1A0122	Date Extracted:	20-Jan-21
Matrix:	Aqueous	Sample Size:	0.100 L	Column:	ZB-50

Analyte	Conc. (pg/L)	MDL	RL	Qualifiers	Analyzed	Dilution
Hexachlorobenzene	45.4	331	400	J	08-Feb-21 16:33	1
alpha-BHC	ND	124	400		08-Feb-21 16:33	1
Lindane (gamma-BHC)	ND	116	400		08-Feb-21 16:33	1
beta-BHC	ND	139	400		08-Feb-21 16:33	1
delta-BHC	ND	126	400		08-Feb-21 16:33	1
Heptachlor	ND	80.8	400		08-Feb-21 16:33	1
Aldrin	ND	122	400		08-Feb-21 16:33	1
Oxychlordane	ND	122	400		08-Feb-21 16:33	1
cis-Heptachlor Epoxide	ND	89.8	400		08-Feb-21 16:33	1
trans-Heptachlor Epoxide	ND	198	400		08-Feb-21 16:33	1
trans-Chlordane (gamma)	ND	120	400		08-Feb-21 16:33	1
trans-Nonachlor	ND	196	400		08-Feb-21 16:33	1
cis-Chlordane (alpha)	ND	190	400		08-Feb-21 16:33	1
Endosulfan I (alpha)	ND	1870	2000		08-Feb-21 16:33	1
2,4'-DDE	ND	90.8	400		08-Feb-21 16:33	1
4,4'-DDE	ND	114	400		08-Feb-21 16:33	1
Dieldrin	ND	98.9	400		08-Feb-21 16:33	1
Endrin	ND	140	400		08-Feb-21 16:33	1
cis-Nonachlor	ND	116	400		08-Feb-21 16:33	1
Endosulfan II (beta)	ND	1740	2000		08-Feb-21 16:33	1
2,4'-DDD	ND	128	400		08-Feb-21 16:33	1
2,4'-DDT	ND	174	400		08-Feb-21 16:33	1
4,4'-DDD	ND	176	400		08-Feb-21 16:33	1
4,4'-DDT	ND	182	400		08-Feb-21 16:33	1
Endosulfan Sulfate	ND	1560	2000		08-Feb-21 16:33	1
4,4'-Methoxychlor	ND	1710	2000		08-Feb-21 16:33	1
Mirex	ND	126	400		08-Feb-21 16:33	1
Endrin Aldehyde	ND	1460	2000		08-Feb-21 16:33	1
Endrin Ketone	ND	1470	2000		08-Feb-21 16:33	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C6-Hexachlorobenzene	IS	72.2	5 - 120		08-Feb-21 16:33	1
13C6-alpha-BHC	IS	80.5	32 - 130		08-Feb-21 16:33	1
13C6-Lindane (gamma-BHC)	IS	78.8	11 - 120		08-Feb-21 16:33	1
13C6-beta-BHC	IS	75.2	32 - 130		08-Feb-21 16:33	1
13C6-delta-BHC	IS	81.3	36 - 137		08-Feb-21 16:33	1
13C10-Heptachlor	IS	72.3	5 - 120		08-Feb-21 16:33	1
13C12-Aldrin	IS	83.4	5 - 120		08-Feb-21 16:33	1
13C10-Oxychlordane	IS	96.5	23 - 135		08-Feb-21 16:33	1
13C10-cis-Heptachlor Epoxide	IS	97.2	27 - 137		08-Feb-21 16:33	1
13C10-trans-Chlordane (gamma)	IS	86.0	21 - 132		08-Feb-21 16:33	1
13C10-trans-Nonachlor	IS	83.3	14 - 136		08-Feb-21 16:33	1
13C9-Endosulfan I (alpha)	IS	111	15 - 148		08-Feb-21 16:33	1
13C12-2,4'-DDE	IS	108	47 - 160		08-Feb-21 16:33	1
13C12-4,4'-DDE	IS	99.8	47 - 160		08-Feb-21 16:33	1
13C12-Dieldrin	IS	89.8	40 - 151		08-Feb-21 16:33	1
13C12-Endrin	IS	75.6	35 - 155		08-Feb-21 16:33	1
13C10-cis-Nonachlor	IS	74.6	36 - 139		08-Feb-21 16:33	1
13C9-Endosulfan II (beta)	IS	88.5	5 - 122		08-Feb-21 16:33	1
13C12-2,4'-DDD	IS	87.9	5 - 199		08-Feb-21 16:33	1
13C12-2,4'-DDT	IS	80.0	5 - 199		08-Feb-21 16:33	1
13C12-4,4'-DDD	IS	79.6	5 - 120		08-Feb-21 16:33	1

<b>Client Data</b>		<b>Laboratory Data</b>			
Name:	CDIM Engineering	Lab Sample:	B1A0122-BLK1		
Project:	LRTC Industrial Stormwater	QC Batch:	B1A0122	Date Extracted:	20-Jan-21
Matrix:	Aqueous	Sample Size:	0.100 L	Column:	ZB-50

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C12-4,4'-DDT	IS	83.1	5 - 120		08-Feb-21 16:33	1
13C9-Endosulfan Sulfate	IS	81.5	15 - 148		08-Feb-21 16:33	1
13C12-Methoxychlor	IS	85.5	5 - 120		08-Feb-21 16:33	1
13C10-Mirex	IS	76.5	5 - 120		08-Feb-21 16:33	1
13C12-Endrin Aldehyde	IS	42.2	15 - 148		08-Feb-21 16:33	1
13C12-Endrin Ketone	IS	68.9	15 - 148		08-Feb-21 16:33	1

MDL - Method Detection Limit  
RL - Reporting limit



Sample ID: OPR				EPA Method 1699			
<b>Client Data</b> Name: CDIM Engineering Project: LRTC Industrial Stormwater Matrix: Aqueous			<b>Laboratory Data</b> Lab Sample: B1A0122-BS1 QC Batch: B1A0122      Date Extracted: 20-Jan-21 06:04 Sample Size: 0.100 L      Column: ZB-50				
Analyte	Amt Found (pg/L)	Spike Amt	% Recovery	Limits	Qualifiers	Analyzed	Dilution
Hexachlorobenzene	20900	20000	105	50-120	B	08-Feb-21 11:42	1
alpha-BHC	21300	20000	107	50-120		08-Feb-21 11:42	1
Lindane (gamma-BHC)	20700	20000	104	50-120		08-Feb-21 11:42	1
beta-BHC	20800	20000	104	50-120		08-Feb-21 11:42	1
delta-BHC	21300	20000	106	50-120		08-Feb-21 11:42	1
Heptachlor	19200	20000	96.1	50-120		08-Feb-21 11:42	1
Aldrin	20000	20000	99.8	50-120		08-Feb-21 11:42	1
Oxychlordane	19800	20000	99.2	50-120		08-Feb-21 11:42	1
cis-Heptachlor Epoxide	20200	20000	101	50-120		08-Feb-21 11:42	1
trans-Heptachlor Epoxide	19700	20000	98.3	50-120		08-Feb-21 11:42	1
trans-Chlordane (gamma)	20300	20000	102	50-120		08-Feb-21 11:42	1
trans-Nonachlor	21000	20000	105	50-120		08-Feb-21 11:42	1
cis-Chlordane (alpha)	22800	20000	114	50-120		08-Feb-21 11:42	1
Endosulfan I (alpha)	18700	20000	93.5	50-120		08-Feb-21 11:42	1
2,4'-DDE	19700	20000	98.5	24-123		08-Feb-21 11:42	1
4,4'-DDE	19600	20000	97.9	50-120		08-Feb-21 11:42	1
Dieldrin	21700	20000	109	50-120		08-Feb-21 11:42	1
Endrin	19900	20000	99.5	50-120		08-Feb-21 11:42	1
cis-Nonachlor	21400	20000	107	50-120		08-Feb-21 11:42	1
Endosulfan II (beta)	20200	20000	101	5-200		08-Feb-21 11:42	1
2,4'-DDD	21900	20000	110	50-120		08-Feb-21 11:42	1
2,4'-DDT	23300	20000	117	50-120		08-Feb-21 11:42	1
4,4'-DDD	21600	20000	108	42-120		08-Feb-21 11:42	1
4,4'-DDT	21100	20000	105	50-120		08-Feb-21 11:42	1
Endosulfan Sulfate	20900	20000	105	50-120		08-Feb-21 11:42	1
4,4'-Methoxychlor	21000	20000	105	50-120		08-Feb-21 11:42	1
Mirex	20100	20000	101	50-120		08-Feb-21 11:42	1
Endrin Aldehyde	19600	20000	98.2	50-134		08-Feb-21 11:42	1
Endrin Ketone	19000	20000	95.2	50-134		08-Feb-21 11:42	1
Labeled Standards	Type		% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C6-Hexachlorobenzene	IS		52.9	5-120		08-Feb-21 11:42	1
13C6-alpha-BHC	IS		85.9	17-141		08-Feb-21 11:42	1
13C6-Lindane (gamma-BHC)	IS		90.4	5-124		08-Feb-21 11:42	1
13C6-beta-BHC	IS		91.8	17-141		08-Feb-21 11:42	1
13C6-delta-BHC	IS		92.2	16-150		08-Feb-21 11:42	1
13C10-Heptachlor	IS		63.4	5-128		08-Feb-21 11:42	1
13C12-Aldrin	IS		71.3	5-126		08-Feb-21 11:42	1
13C10-Oxychlordane	IS		95.9	5-144		08-Feb-21 11:42	1
13C10-cis-Heptachlor Epoxide	IS		105	8-146		08-Feb-21 11:42	1
13C10-trans-Chlordane (gamma)	IS		110	15-144		08-Feb-21 11:42	1
13C10-trans-Nonachlor	IS		103	13-149		08-Feb-21 11:42	1
13C9-Endosulfan I (alpha)	IS		119	5-144		08-Feb-21 11:42	1
13C12-2,4'-DDE	IS		110	26-169		08-Feb-21 11:42	1
13C12-4,4'-DDE	IS		97.8	26-169		08-Feb-21 11:42	1
13C12-Dieldrin	IS		86.0	19-161		08-Feb-21 11:42	1

Sample ID: OPR				EPA Method 1699		
<b>Client Data</b> Name: CDIM Engineering Project: LRTC Industrial Stormwater Matrix: Aqueous		<b>Laboratory Data</b> Lab Sample: B1A0122-BS1 QC Batch: B1A0122      Date Extracted: 20-Jan-21 06:04 Sample Size: 0.100 L      Column: ZB-50				
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C12-Endrin	IS	84.7	20-157		08-Feb-21 11:42	1
13C10-cis-Nonachlor	IS	95.5	17-154		08-Feb-21 11:42	1
13C9-Endosulfan II (beta)	IS	103	5-120		08-Feb-21 11:42	1
13C12-2,4'-DDD	IS	87.8	14-200		08-Feb-21 11:42	1
13C12-2,4'-DDT	IS	86.8	14-200		08-Feb-21 11:42	1
13C12-4,4'-DDD	IS	85.5	14-200		08-Feb-21 11:42	1
13C12-4,4'-DDT	IS	92.4	13-200		08-Feb-21 11:42	1
13C9-Endosulfan Sulfate	IS	89.0	5-144		08-Feb-21 11:42	1
13C12-Methoxychlor	IS	93.6	8-200		08-Feb-21 11:42	1
13C10-Mirex	IS	103	5-138		08-Feb-21 11:42	1
13C12-Endrin Aldehyde	IS	49.2	5-144		08-Feb-21 11:42	1
13C12-Endrin Ketone	IS	76.8	5-144		08-Feb-21 11:42	1

## Sample ID: TS2-I-201213

## EPA Method 1699

Client Data		Laboratory Data			
Name:	CDIM Engineering	Lab Sample:	2002712-01	Date Received:	15-Dec-20 11:13
Project:	LRTC Industrial Stormwater	QC Batch:	B1A0122	Date Extracted:	20-Jan-21
Matrix:	Water	Sample Size:	0.109 L	Column:	ZB-50
Date Collected:	13-Dec-20 09:40				

Analyte	Conc. (pg/L)	MDL	RL	Qualifiers	Analyzed	Dilution
Hexachlorobenzene	5350	304	367	B	08-Feb-21 19:48	1
alpha-BHC	ND	114	367		08-Feb-21 19:48	1
Lindane (gamma-BHC)	ND	106	367		08-Feb-21 19:48	1
beta-BHC	ND	127	367		08-Feb-21 19:48	1
delta-BHC	ND	116	367		08-Feb-21 19:48	1
Heptachlor	ND	74.1	367		08-Feb-21 19:48	1
Aldrin	ND	112	367		08-Feb-21 19:48	1
Oxychlordane	ND	112	367		08-Feb-21 19:48	1
cis-Heptachlor Epoxide	ND	82.3	367		08-Feb-21 19:48	1
trans-Heptachlor Epoxide	ND	182	367		08-Feb-21 19:48	1
trans-Chlordane (gamma)	780	110	367		08-Feb-21 19:48	1
trans-Nonachlor	552	180	367		08-Feb-21 19:48	1
cis-Chlordane (alpha)	1100	174	367		08-Feb-21 19:48	1
Endosulfan I (alpha)	ND	1710	1830		08-Feb-21 19:48	1
2,4'-DDE	303	83.3	367	J	08-Feb-21 19:48	1
4,4'-DDE	3730	105	367		08-Feb-21 19:48	1
Dieldrin	1820	90.7	367		08-Feb-21 19:48	1
Endrin	967	128	367		08-Feb-21 19:48	1
cis-Nonachlor	ND	106	367		08-Feb-21 19:48	1
Endosulfan II (beta)	ND	1600	1830		08-Feb-21 19:48	1
2,4'-DDD	1660	117	367		08-Feb-21 19:48	1
2,4'-DDT	1410	160	367		08-Feb-21 19:48	1
4,4'-DDD	3220	161	367		08-Feb-21 19:48	1
4,4'-DDT	14800	167	367		08-Feb-21 19:48	1
Endosulfan Sulfate	ND	1430	1830		08-Feb-21 19:48	1
4,4'-Methoxychlor	ND	1570	1830		08-Feb-21 19:48	1
Mirex	ND	116	367		08-Feb-21 19:48	1
Endrin Aldehyde	ND	1340	1830		08-Feb-21 19:48	1
Endrin Ketone	ND	1350	1830		08-Feb-21 19:48	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C6-Hexachlorobenzene	IS	84.2	5 - 120		08-Feb-21 19:48	1
13C6-alpha-BHC	IS	74.9	32 - 130		08-Feb-21 19:48	1
13C6-Lindane (gamma-BHC)	IS	72.1	11 - 120		08-Feb-21 19:48	1
13C6-beta-BHC	IS	61.3	32 - 130		08-Feb-21 19:48	1
13C6-delta-BHC	IS	65.1	36 - 137		08-Feb-21 19:48	1
13C10-Heptachlor	IS	69.6	5 - 120		08-Feb-21 19:48	1
13C12-Aldrin	IS	76.0	5 - 120		08-Feb-21 19:48	1
13C10-Oxychlordane	IS	84.2	23 - 135		08-Feb-21 19:48	1
13C10-cis-Heptachlor Epoxide	IS	68.1	27 - 137		08-Feb-21 19:48	1
13C10-trans-Chlordane (gamma)	IS	59.1	21 - 132		08-Feb-21 19:48	1
13C10-trans-Nonachlor	IS	61.2	14 - 136		08-Feb-21 19:48	1
13C9-Endosulfan I (alpha)	IS	80.3	15 - 148		08-Feb-21 19:48	1
13C12-2,4'-DDE	IS	86.6	47 - 160		08-Feb-21 19:48	1
13C12-4,4'-DDE	IS	77.2	47 - 160		08-Feb-21 19:48	1
13C12-Dieldrin	IS	69.0	40 - 151		08-Feb-21 19:48	1
13C12-Endrin	IS	53.8	35 - 155		08-Feb-21 19:48	1
13C10-cis-Nonachlor	IS	42.6	36 - 139		08-Feb-21 19:48	1
13C9-Endosulfan II (beta)	IS	42.5	5 - 122		08-Feb-21 19:48	1
13C12-2,4'-DDD	IS	64.4	5 - 199		08-Feb-21 19:48	1
13C12-2,4'-DDT	IS	53.8	5 - 199		08-Feb-21 19:48	1
13C12-4,4'-DDD	IS	41.1	5 - 120		08-Feb-21 19:48	1

<b>Client Data</b>		<b>Laboratory Data</b>			
Name:	CDIM Engineering	Lab Sample:	2002712-01	Date Received:	15-Dec-20 11:13
Project:	LRTC Industrial Stormwater	QC Batch:	B1A0122	Date Extracted:	20-Jan-21
Matrix:	Water	Sample Size:	0.109 L	Column:	ZB-50
Date Collected:	13-Dec-20 09:40				

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C12-4,4'-DDT	IS	36.7	5 - 120		08-Feb-21 19:48	1
13C9-Endosulfan Sulfate	IS	22.8	15 - 148		08-Feb-21 19:48	1
13C12-Methoxychlor	IS	28.9	5 - 120		08-Feb-21 19:48	1
13C10-Mirex	IS	37.7	5 - 120		08-Feb-21 19:48	1
13C12-Endrin Aldehyde	IS	25.9	15 - 148		08-Feb-21 19:48	1
13C12-Endrin Ketone	IS	17.1	15 - 148		08-Feb-21 19:48	1

MDL - Method Detection Limit  
RL - Reporting limit

## DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
CRS	Cleanup Recovery Standard
D	Dilution
DL	Detection Limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
IS	Internal Standard
J	The amount detected is below the Reporting Limit/LOQ
K	EMPC (specific projects only)
LOD	Limit of Detection
LOQ	Limit of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
MDL	Method Detection Limit
NA	Not applicable
ND	Not Detected
OPR	Ongoing Precision and Recovery sample
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
RL	Reporting Limit
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

### Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-23
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Massachusetts Department of Environmental Protection	N/A
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718-B
New Jersey Department of Environmental Protection	190001
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	016
Texas Commission on Environmental Quality	T104704189-19-10
Vermont Department of Health	VT-4042
Virginia Department of General Services	10272
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

## NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	Method
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

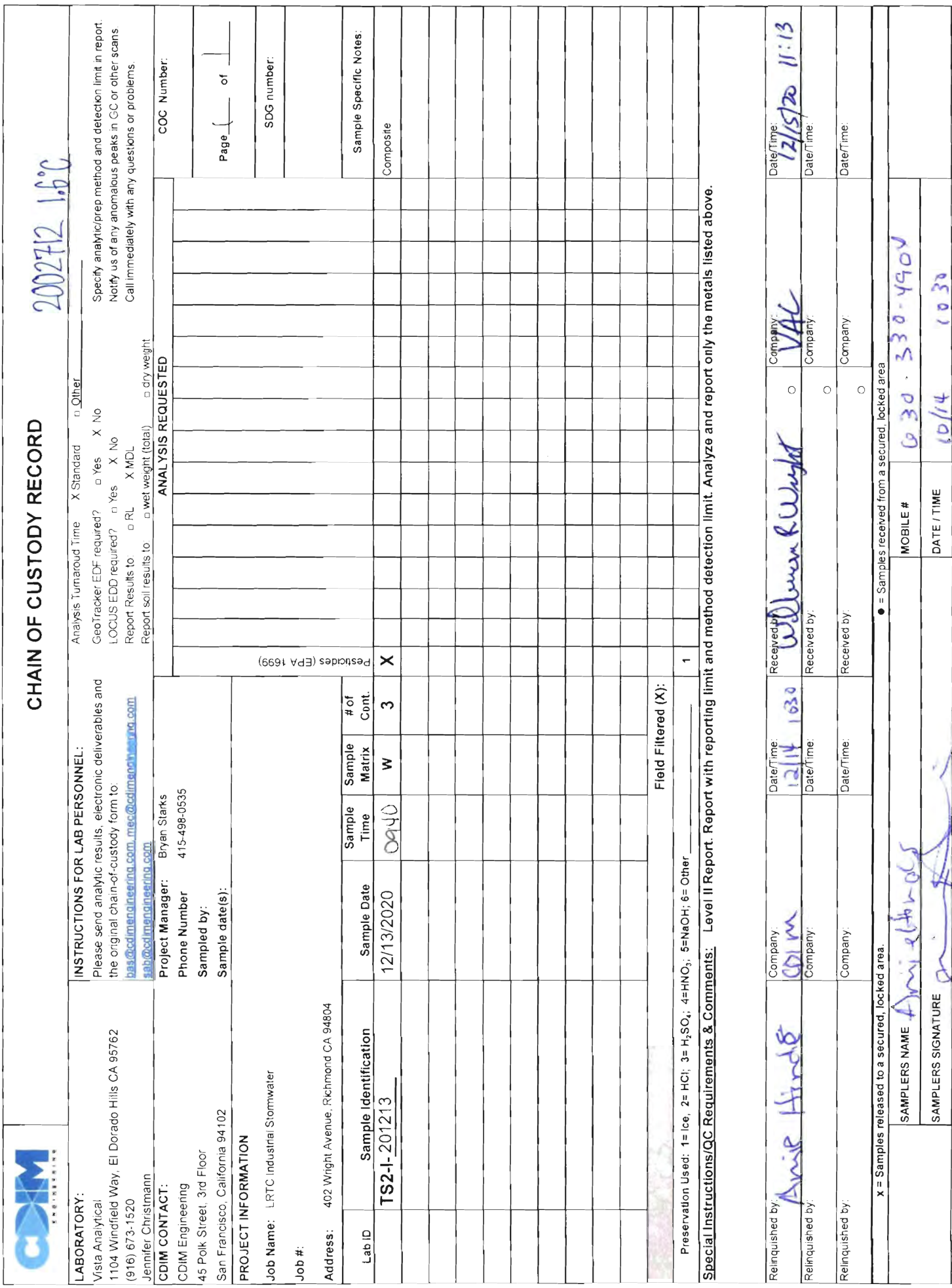
MATRIX: Biological Tissue	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	Method
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009



MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	Method
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A



# Sample Log-In Checklist

 Page # 1 of 1

 Vista Work Order #: 2002712 TAT std

Samples Arrival:	Date/Time <u>12/15/20 11:13</u>	Initials: <u>www</u>	Location: <u>WR-2</u>
			Shelf/Rack: <u>NA</u>
Delivered By:	<input checked="" type="radio"/> FedEx	<input type="radio"/> UPS	<input type="radio"/> On Trac
		<input type="radio"/> GLS	<input type="radio"/> DHL
		<input type="radio"/> Hand Delivered	<input type="radio"/> Other
Preservation:	<input checked="" type="radio"/> Ice	<input type="radio"/> Blue Ice	<input type="radio"/> Techni Ice
		<input type="radio"/> Dry Ice	<input type="radio"/> None
Temp °C: <u>1.6</u>	(uncorrected)	Probe used: Y / <input checked="" type="radio"/> N	Thermometer ID: <u>IR-3</u>
Temp °C: <u>1.6</u>	(corrected)		

	YES	NO	NA
Shipping Container(s) Intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shipping Custody Seals Intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Airbill <u>      </u>	Trk # <u>7813 9337 3881</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Shipping Documentation Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shipping Container	<input checked="" type="radio"/> Vista	<input type="radio"/> Client	<input checked="" type="radio"/> Retain
	<input type="radio"/> Return	<input type="radio"/> Dispose	
Chain of Custody / Sample Documentation Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chain of Custody / Sample Documentation Complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Holding Time Acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Logged In:	Date/Time <u>12/15/20 1152</u>	Initials: <u>WWS</u>	Location: <u>WR-2</u>
			Shelf/Rack: <u>B-1, C-2</u>
COC Anomaly/Sample Acceptance Form completed?			<input checked="" type="checkbox"/>

 Comments: \*TAPE Broken upon Receipt.

# CoC/Label Reconciliation Report WO# 2002712

LabNumber	CoC Sample ID	Sample Alias	Sample Date/Time	Container	BaseMatrix	Sample Comments
2002712-01	A TS2-I-201213	<input checked="" type="checkbox"/>	13-Dec-20 09:40	Amber Glass NM Bottle, 1L	Aqueous	
2002712-01	B TS2-I-201213	<input checked="" type="checkbox"/>	13-Dec-20 09:40	Amber Glass NM Bottle, 1L	Aqueous	
2002712-01	C TS2-I-201213	<input checked="" type="checkbox"/>	13-Dec-20 09:40	Amber Glass NM Bottle, 1L	Aqueous	

Checkmarks indicate that information on the COC reconciled with the sample label. Any discrepancies are noted in the following columns.

	Yes	No	NA
Sample Container Intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample Custody Seals Intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Adequate Sample Volume?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Container Type Appropriate for Analysis(es)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Preservation Documented: Na2S2O3 Trizma <u>None</u> Other	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
If Chlorinated or Drinking Water Samples, Acceptable Preservation?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments: 8 sample label: 1000; dates reconcile

Verified by/Date: WJS 12/15/20

## ANOMALY FORM

### Vista Work Order

2002712

Initial/Date The following checked issues were noted during sample receipt and login:

- \_\_\_\_\_ ☐ 1. The samples were received out of temperature at (WI-PHT): \_\_\_\_\_  
Was Ice present: Yes No Melted Blue Ice
- \_\_\_\_\_ ☐ 2. The Chain-of-Custody (CoC) was not relinquished properly.
- \_\_\_\_\_ ☐ 3. The CoC did not include collection time(s). 00:00 will be used unless notified otherwise.
- \_\_\_\_\_ ☐ 4. The sample(s) did not include a sample collection time. All or Sample Name: \_\_\_\_\_
- \_\_\_\_\_ ☐ 5. A sample ID discrepancy was found. See the Reconciliation report.  
The CoC Sample ID will be used unless notified otherwise.
- WIS 12/15/20 ☒ 6. A sample date and/or time discrepancy was found. See the Reconciliation report.  
The CoC Sample date/time will be used unless notified otherwise.
- \_\_\_\_\_ ☐ 7. The CoC did not include a sample matrix. The following sample matrix will be used: \_\_\_\_\_
- \_\_\_\_\_ ☐ 8. Insufficient volume received for analysis. All or Sample Name: \_\_\_\_\_
- \_\_\_\_\_ ☐ 9. The backup bottle was received broken. Sample Name: \_\_\_\_\_
- \_\_\_\_\_ ☐ 10. CoC not received, illegible or destroyed.
- \_\_\_\_\_ ☐ 11. The sample(s) were received out of holding time. All or Sample Name: \_\_\_\_\_
- \_\_\_\_\_ ☐ 12. The CoC did not include an analysis. All or Sample Name: \_\_\_\_\_
- \_\_\_\_\_ ☐ 13. Sample(s) received without collection date. All or Sample Name: \_\_\_\_\_
- \_\_\_\_\_ ☐ 14. Sample(s) not received. All or Sample Name: \_\_\_\_\_
- \_\_\_\_\_ ☐ 15. Sample(s) received broken. All or Sample Name: \_\_\_\_\_
- \_\_\_\_\_ ☐ 16. An incorrect container-type was used. All or Sample Name: \_\_\_\_\_
- \_\_\_\_\_ ☐ 17. Other: \_\_\_\_\_

Bolded items require sign-off

Client Contacted: \_\_\_\_\_

Date of Contact: \_\_\_\_\_

Vista Client Manager: \_\_\_\_\_

Resolution: \_\_\_\_\_



## LEVEL 2 DATA REVIEW SUMMARY

**Project Name:** LRTC 2020-2021 Storm Water

**Project Number:** 101-006-LRTC, Task 1

**Analyses:** EPA 1699

**Lab Order Number:** 2002712

**Sample Dates:** 12/13/20

Laboratory QC Criteria	Yes	No	NA
Have all samples been extracted/analyzed within holding times?	X		
Are detection and reporting limits acceptable?	X		
Are all surrogate recoveries in all samples within QC limits?	X		
Are all LCS (BS) recoveries within QC limits?	X		
Are all MS/MSD recoveries and RPDs within QC limits?			X
Are method blanks free of contamination?		X <sup>1</sup>	
Are travel blanks free of contamination?			X
Are field/equipment blanks free of contamination?			X
Are all compounds present in either the sample or duplicate also present in the other?			X
Are all RPDs between sample and duplicate acceptable?			X

### Flags:

Sample ID	Compound	Det Flag	Lab Quals	Val Quals	Final Quals	Reportable Result?
TS2-I-201213	Hexachloro-benzene	--	B	--	B	Yes
	2,4'-DDE	--	J	--	J	Yes

B = the compound was also detected in the method blank

J = identification of the analyte is acceptable; reported value is an estimate (result is between laboratory detection and reporting limits)

### Comments:

1. Hexachlorobenzene was detected in the method blank at a concentration of 45.4 (J) pg/L. Sample result for hexachlorobenzene was B-flagged by the lab.

Reviewed by:

Date: 02/10/21



## CDIM Engineering - San Francisco, CA

Sample Delivery Group: L1296923  
Samples Received: 12/15/2020  
Project Number:  
Description: LRTC Industrial Stormwater  
  
Report To: Bryan Starks  
45 Polk Street  
3rd Floor  
San Francisco, CA 94102

Entire Report Reviewed By:



Jennifer Gambill  
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

**Pace Analytical National**

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 [www.pacenational.com](http://www.pacenational.com)





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# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



## TS1-I-201213 L1296923-01 WW

				Collected by	Collected date/time	Received date/time
					12/13/20 09:24	12/15/20 09:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1594084	1	12/18/20 09:24	12/18/20 11:23	MML	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1594082	1	12/18/20 09:00	12/18/20 13:26	MBP	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1594661	1	12/19/20 11:52	12/19/20 11:52	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1594804	1	12/21/20 06:59	12/22/20 21:25	LD	Mt. Juliet, TN

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

## TS2-I-201213 L1296923-02 WW

				Collected by	Collected date/time	Received date/time
					12/13/20 10:00	12/15/20 09:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1594084	1	12/18/20 09:24	12/18/20 11:23	MML	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1594087	1	12/18/20 09:18	12/18/20 13:15	MBP	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1594661	1	12/19/20 11:52	12/19/20 11:52	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1594804	1	12/21/20 06:59	12/22/20 21:28	LD	Mt. Juliet, TN

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

## TS3-I-201213 L1296923-03 WW

				Collected by	Collected date/time	Received date/time
					12/13/20 10:32	12/15/20 09:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1594028	1	12/18/20 04:42	12/18/20 06:08	MML	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1594087	1	12/18/20 09:18	12/18/20 13:15	MBP	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1594661	1	12/19/20 11:52	12/19/20 11:52	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1594804	1	12/21/20 06:59	12/22/20 21:31	LD	Mt. Juliet, TN

<sup>8</sup> Al

<sup>9</sup> Sc

## TS4-I-201213 L1296923-04 WW

				Collected by	Collected date/time	Received date/time
					12/13/20 10:56	12/15/20 09:30
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1594028	1	12/18/20 04:42	12/18/20 06:08	MML	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1594087	1	12/18/20 09:18	12/18/20 13:15	MBP	Mt. Juliet, TN
Wet Chemistry by Method 9040C	WG1594661	1	12/19/20 11:52	12/19/20 11:52	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1594804	1	12/21/20 06:59	12/22/20 21:43	LD	Mt. Juliet, TN

ACCOUNT:

CDIM Engineering - San Francisco, CA

PROJECT:

SDG:

L1296923

DATE/TIME:

12/24/20 11:24

PAGE:

3 of 17



All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jennifer Gambill  
Project Manager

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	185		2.33	16.7	1	12/18/2020 11:23	<a href="#">WG1594084</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	2.30	J	1.16	5.00	1	12/18/2020 13:26	<a href="#">WG1594082</a>

## Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.48	T8	1	12/19/2020 11:52	<a href="#">WG1594661</a>

## Sample Narrative:

L1296923-01 WG1594661: 7.48 at 19.7C

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	1.14		0.0470	0.100	1	12/22/2020 21:25	<a href="#">WG1594804</a>
Iron	3.43		0.0447	0.100	1	12/22/2020 21:25	<a href="#">WG1594804</a>
Lead	0.0319		0.000513	0.00200	1	12/22/2020 21:25	<a href="#">WG1594804</a>
Zinc	0.609		0.00796	0.0200	1	12/22/2020 21:25	<a href="#">WG1594804</a>



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	686	J3	3.50	25.0	1	12/18/2020 11:23	<a href="#">WG1594084</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	5.50		1.16	5.00	1	12/18/2020 13:15	<a href="#">WG1594087</a>

## Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.34	T8	1	12/19/2020 11:52	<a href="#">WG1594661</a>

## Sample Narrative:

L1296923-02 WG1594661: 7.34 at 19.7C

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	0.837		0.0470	0.100	1	12/22/2020 21:28	<a href="#">WG1594804</a>
Iron	3.49		0.0447	0.100	1	12/22/2020 21:28	<a href="#">WG1594804</a>
Lead	0.0140		0.000513	0.00200	1	12/22/2020 21:28	<a href="#">WG1594804</a>
Zinc	0.184		0.00796	0.0200	1	12/22/2020 21:28	<a href="#">WG1594804</a>



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	6.00		0.350	2.50	1	12/18/2020 06:08	<a href="#">WG1594028</a>

1 Cp

2 Tc

3 Ss

4 Cn

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	1.41	J	1.26	5.44	1	12/18/2020 13:15	<a href="#">WG1594087</a>

5 Sr

6 Qc

## Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.23	T8	1	12/19/2020 11:52	<a href="#">WG1594661</a>

7 Gl

8 Al

## Sample Narrative:

L1296923-03 WG1594661: 7.23 at 18.4C

9 Sc

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	0.419		0.0470	0.100	1	12/22/2020 21:31	<a href="#">WG1594804</a>
Iron	0.971		0.0447	0.100	1	12/22/2020 21:31	<a href="#">WG1594804</a>
Lead	0.0227		0.000513	0.00200	1	12/22/2020 21:31	<a href="#">WG1594804</a>
Zinc	0.116		0.00796	0.0200	1	12/22/2020 21:31	<a href="#">WG1594804</a>





## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	21.3		0.350	2.50	1	12/18/2020 06:08	<a href="#">WG1594028</a>

1 Cp

2 Tc

3 Ss

4 Cn

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	1.86	J	1.20	5.15	1	12/18/2020 13:15	<a href="#">WG1594087</a>

5 Sr

6 Qc

## Wet Chemistry by Method 9040C

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.56	T8	1	12/19/2020 11:52	<a href="#">WG1594661</a>

7 Gl

8 Al

## Sample Narrative:

L1296923-04 WG1594661: 7.56 at 19.3C

9 Sc

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	0.581		0.0470	0.100	1	12/22/2020 21:43	<a href="#">WG1594804</a>
Iron	1.16		0.0447	0.100	1	12/22/2020 21:43	<a href="#">WG1594804</a>
Lead	0.0100		0.000513	0.00200	1	12/22/2020 21:43	<a href="#">WG1594804</a>
Zinc	0.0684		0.00796	0.0200	1	12/22/2020 21:43	<a href="#">WG1594804</a>

Method Blank (MB)

(MB) R3605433-1 12/18/20 06:08

Analyte	MB Result mg/l	<u>MB Qualifier</u>	MB MDL mg/l	MB RDL mg/l
Suspended Solids	U		0.350	2.50

Laboratory Control Sample (LCS)

(LCS) R3605433-2 12/18/20 06:08

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	<u>LCS Qualifier</u>
Suspended Solids	773	808	105	85.7-114	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3605416-1 12/18/20 11:23

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Suspended Solids	U		0.350	2.50

L1296923-02 Original Sample (OS) • Duplicate (DUP)

(OS) L1296923-02 12/18/20 11:23 • (DUP) R3605416-3 12/18/20 11:23

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Suspended Solids	686	1840	1	91.2	J3	5

L1296974-03 Original Sample (OS) • Duplicate (DUP)

(OS) L1296974-03 12/18/20 11:23 • (DUP) R3605416-4 12/18/20 11:23

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Suspended Solids	2530	887	1	96.2	J3	5

Laboratory Control Sample (LCS)

(LCS) R3605416-2 12/18/20 11:23

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Suspended Solids	773	820	106	85.7-114	

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3605133-1 12/18/20 10:35

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Oil & Grease (Hexane Extr)	U		1.16	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3605133-2 12/18/20 10:35 • (LCSD) R3605133-3 12/18/20 10:35

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Oil & Grease (Hexane Extr)	40.0	38.2	33.5	95.5	83.8	78.0-114			13.1	20

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3605121-1 12/18/20 10:30

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Oil & Grease (Hexane Extr)	U		1.16	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3605121-2 12/18/20 10:30 • (LCSD) R3605121-3 12/18/20 10:30

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Oil & Grease (Hexane Extr)	40.0	38.8	36.5	97.0	91.3	78.0-114			6.11	20

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc



Laboratory Control Sample (LCS)

(LCS) R3605371-1 12/19/20 11:52

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
	su	su	%	%	
pH	10.0	10.1	101	99.0-101	

Sample Narrative:

LCS: 10.06 at 18.2C

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc



Method Blank (MB)

(MB) R3606389-1 12/22/20 19:32

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum	U		0.0470	0.100
Iron	U		0.0447	0.100
Lead	U		0.000513	0.00200
Zinc	U		0.00796	0.0200

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Laboratory Control Sample (LCS)

(LCS) R3606389-2 12/22/20 19:36

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum	5.00	4.94	98.7	85.0-115	
Iron	5.00	5.18	104	85.0-115	
Lead	0.0500	0.0521	104	85.0-115	
Zinc	0.500	0.513	103	85.0-115	

L1296850-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1296850-04 12/22/20 19:39 • (MS) R3606389-4 12/22/20 19:45 • (MSD) R3606389-5 12/22/20 19:49

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	5.00	U	4.81	4.87	96.3	97.5	1	70.0-130			1.25	20
Iron	5.00	U	4.99	5.15	99.8	103	1	70.0-130			3.04	20
Lead	0.0500	0.000865	0.0472	0.0514	92.7	101	1	70.0-130			8.47	20
Zinc	0.500	0.0122	0.504	0.517	98.4	101	1	70.0-130			2.60	20

L1296941-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1296941-03 12/22/20 19:52 • (MS) R3606389-6 12/22/20 19:55 • (MSD) R3606389-7 12/22/20 19:58

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	5.00	0.715	5.87	5.88	103	103	1	70.0-130			0.176	20
Iron	5.00	2.42	7.78	7.56	107	103	1	70.0-130			2.87	20
Lead	0.0500	0.0275	0.0805	0.0805	106	106	1	70.0-130			0.0481	20
Zinc	0.500	0.172	0.703	0.687	106	103	1	70.0-130			2.31	20





## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

## Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

## Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
T8	Sample(s) received past/too close to holding time expiration.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

\* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

\* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

## State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey-NELAP	TN002
California	2932	New Mexico <sup>1</sup>	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina <sup>1</sup>	DW21704
Georgia	NELAP	North Carolina <sup>3</sup>	41
Georgia <sup>1</sup>	923	North Dakota	R-140
Idaho	TN00003	Ohio-VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky <sup>1,6</sup>	KY90010	South Carolina	84004
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1,4</sup>	2006
Louisiana <sup>1</sup>	LA180010	Texas	T104704245-20-18
Maine	TN00003	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA

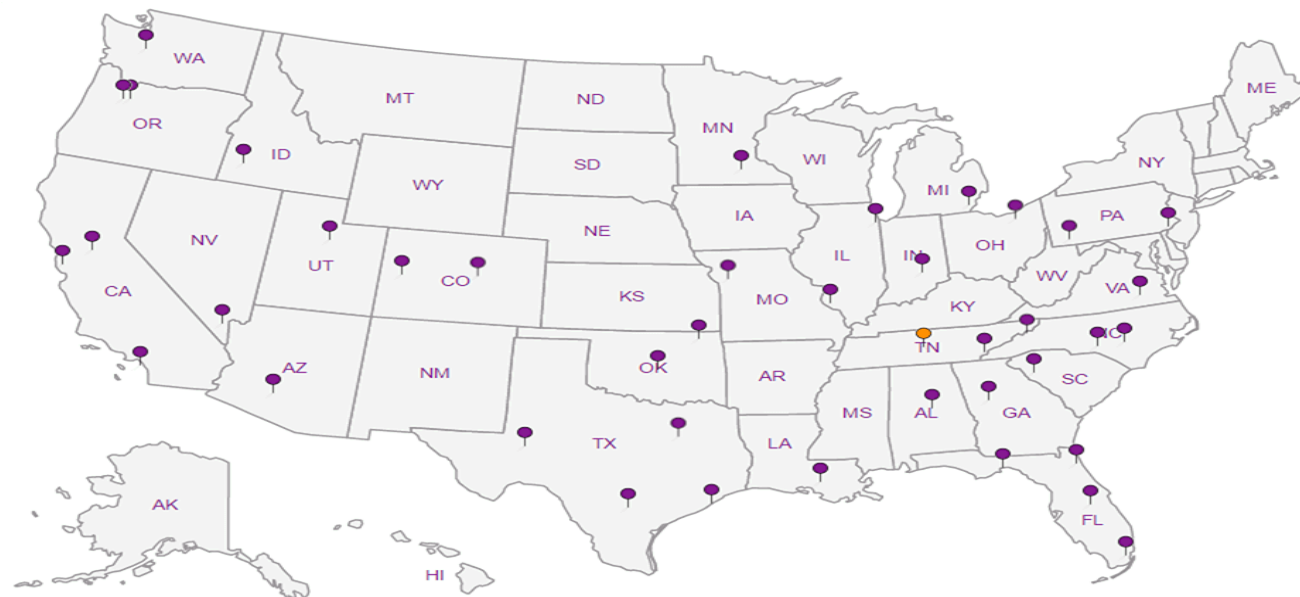
## Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA-Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>6</sup> Wastewater n/a Accreditation not applicable

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.







## LEVEL 2 DATA REVIEW SUMMARY

**Project Name:** LRTC 2020-2021 Storm Water

**Project Number:** 101-005-LRTC, Task 1

**Analyses:** EPA 200.8, 1664A, EPA 9040C; SM2540D

**Lab Order Number:** L1296923

**Sample Dates:** 12/13/20

Laboratory QC Criteria	Yes	No	NA
Have all samples been extracted/analyzed within holding times?		X <sup>1</sup>	
Are detection and reporting limits acceptable?	X		
Are all surrogate recoveries in all samples within QC limits?			X
Are all LCS (BS) recoveries within QC limits?	X		
Are all MS/MSD recoveries and RPDs within QC limits?	X		
Are method blanks free of contamination?	X		
Are travel blanks free of contamination?			X
Are field/equipment blanks free of contamination?			X
Are all compounds present in either the sample or duplicate also present in the other?	X		
Are all RPDs between sample and duplicate acceptable?	X <sup>2</sup>		

### Flags:

Sample ID	Compound	Det Flag	Lab Quals	Val Quals	Final Quals	Reportable Result?
TS1-I-201213 TS2-I-201213 TS3-I-201213 TS4-I-201213	pH	--	T8	--	none	Yes
TS1-I-201213	Oil and Grease	J	--	--	J	Yes
TS2-I-201213	TSS	J3	--	--	J3	Yes
TS3-I-201213	Oil and Grease	J	--	--	J	Yes
TS4-I-201213	Oil and Grease	J	--	--	J	Yes

J = identification of the analyte is acceptable; reported value is an estimate (result is between laboratory detection and reporting limits)

J3 = the associated batch QC was outside the established quality control range for precision

T8 = samples received past/too close to holding time expiration

NOTE: Laboratory invoices should not be approved for payment until this review has been completed and all issues resolved.



**Comments:**

1. pH not analyzed within 15 minutes of sampling, however analyzed upon receipt by laboratory.
2. RPD between primary and duplicate for laboratory duplicate of TSS for sample TS2-I-201213 outside of acceptable range, assumed to be due to sample heterogeneity. The lab used a J3 flag; this is acceptable for denoting result is approximate.

Reviewed by:

A handwritten signature in blue ink, appearing to be 'M. J.', is written over a horizontal line.

Date: 12/29/20



February 09, 2021

**Vista Work Order No. 2002713**

Mr. Bryan Starks  
CDIM Engineering  
45 Polk Street, 3rd Floor  
San Francisco, CA 94102


Dear Mr. Starks,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on December 15, 2020 under your Project Name 'LRTC Industrial Stormwater'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at [mmaier@vista-analytical.com](mailto:mmaier@vista-analytical.com).

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

A handwritten signature in black ink, appearing to read "Martha Maier", followed by the word "for" in a standard font.

Martha Maier  
Laboratory Director



*Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.*

**Vista Work Order No. 2002713****Case Narrative****Sample Condition on Receipt:**

One water sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology. The sample was received in good condition and within the method temperature requirements.

**Analytical Notes:****EPA Method 1699**

The three bottles of the sample were composited for extraction and analyzed for chlorinated pesticides by EPA Method 1699 using a ZB-50 GC column. The sample was re-extracted with less volume due to high interference levels.

**Holding Times**

The sample was originally extracted within the method hold time but was re-extracted outside of the method hold time. The analysis was performed within the method hold time.

**Quality Control**

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected above the sample quantitation limits in the Method Blank. The OPR recoveries were within the method acceptance criteria.

Labeled standard recoveries for all QC and field samples were within method acceptance criteria.



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# Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2002713-01	TS2-E-201213	13-Dec-20 09:40	15-Dec-20 11:13	Amber Glass NM Bottle, 1L Amber Glass NM Bottle, 1L Amber Glass NM Bottle, 1L

## **ANALYTICAL RESULTS**

## Sample ID: Method Blank

EPA Method 1699

## Client Data

Name: CDIM Engineering  
 Project: LRTC Industrial Stormwater  
 Matrix: Aqueous

## Laboratory Data

Lab Sample: B1A0122-BLK1  
 QC Batch: B1A0122 Date Extracted: 20-Jan-21  
 Sample Size: 0.100 L Column: ZB-50

Analyte	Conc. (pg/L)	MDL	RL	Qualifiers	Analyzed	Dilution
Hexachlorobenzene	45.4	331	400	J	08-Feb-21 16:33	1
alpha-BHC	ND	124	400		08-Feb-21 16:33	1
Lindane (gamma-BHC)	ND	116	400		08-Feb-21 16:33	1
beta-BHC	ND	139	400		08-Feb-21 16:33	1
delta-BHC	ND	126	400		08-Feb-21 16:33	1
Heptachlor	ND	80.8	400		08-Feb-21 16:33	1
Aldrin	ND	122	400		08-Feb-21 16:33	1
Oxychlordane	ND	122	400		08-Feb-21 16:33	1
cis-Heptachlor Epoxide	ND	89.8	400		08-Feb-21 16:33	1
trans-Heptachlor Epoxide	ND	198	400		08-Feb-21 16:33	1
trans-Chlordane (gamma)	ND	120	400		08-Feb-21 16:33	1
trans-Nonachlor	ND	196	400		08-Feb-21 16:33	1
cis-Chlordane (alpha)	ND	190	400		08-Feb-21 16:33	1
Endosulfan I (alpha)	ND	1870	2000		08-Feb-21 16:33	1
2,4'-DDE	ND	90.8	400		08-Feb-21 16:33	1
4,4'-DDE	ND	114	400		08-Feb-21 16:33	1
Dieldrin	ND	98.9	400		08-Feb-21 16:33	1
Endrin	ND	140	400		08-Feb-21 16:33	1
cis-Nonachlor	ND	116	400		08-Feb-21 16:33	1
Endosulfan II (beta)	ND	1740	2000		08-Feb-21 16:33	1
2,4'-DDD	ND	128	400		08-Feb-21 16:33	1
2,4'-DDT	ND	174	400		08-Feb-21 16:33	1
4,4'-DDD	ND	176	400		08-Feb-21 16:33	1
4,4'-DDT	ND	182	400		08-Feb-21 16:33	1
Endosulfan Sulfate	ND	1560	2000		08-Feb-21 16:33	1
4,4'-Methoxychlor	ND	1710	2000		08-Feb-21 16:33	1
Mirex	ND	126	400		08-Feb-21 16:33	1
Endrin Aldehyde	ND	1460	2000		08-Feb-21 16:33	1
Endrin Ketone	ND	1470	2000		08-Feb-21 16:33	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C6-Hexachlorobenzene	IS	72.2	5 - 120		08-Feb-21 16:33	1
13C6-alpha-BHC	IS	80.5	32 - 130		08-Feb-21 16:33	1
13C6-Lindane (gamma-BHC)	IS	78.8	11 - 120		08-Feb-21 16:33	1
13C6-beta-BHC	IS	75.2	32 - 130		08-Feb-21 16:33	1
13C6-delta-BHC	IS	81.3	36 - 137		08-Feb-21 16:33	1
13C10-Heptachlor	IS	72.3	5 - 120		08-Feb-21 16:33	1
13C12-Aldrin	IS	83.4	5 - 120		08-Feb-21 16:33	1
13C10-Oxychlordane	IS	96.5	23 - 135		08-Feb-21 16:33	1
13C10-cis-Heptachlor Epoxide	IS	97.2	27 - 137		08-Feb-21 16:33	1
13C10-trans-Chlordane (gamma)	IS	86.0	21 - 132		08-Feb-21 16:33	1
13C10-trans-Nonachlor	IS	83.3	14 - 136		08-Feb-21 16:33	1
13C9-Endosulfan I (alpha)	IS	111	15 - 148		08-Feb-21 16:33	1
13C12-2,4'-DDE	IS	108	47 - 160		08-Feb-21 16:33	1
13C12-4,4'-DDE	IS	99.8	47 - 160		08-Feb-21 16:33	1
13C12-Dieldrin	IS	89.8	40 - 151		08-Feb-21 16:33	1
13C12-Endrin	IS	75.6	35 - 155		08-Feb-21 16:33	1
13C10-cis-Nonachlor	IS	74.6	36 - 139		08-Feb-21 16:33	1
13C9-Endosulfan II (beta)	IS	88.5	5 - 122		08-Feb-21 16:33	1
13C12-2,4'-DDD	IS	87.9	5 - 199		08-Feb-21 16:33	1
13C12-2,4'-DDT	IS	80.0	5 - 199		08-Feb-21 16:33	1
13C12-4,4'-DDD	IS	79.6	5 - 120		08-Feb-21 16:33	1

<b>Client Data</b>		<b>Laboratory Data</b>			
Name:	CDIM Engineering	Lab Sample:	B1A0122-BLK1		
Project:	LRTC Industrial Stormwater	QC Batch:	B1A0122	Date Extracted:	20-Jan-21
Matrix:	Aqueous	Sample Size:	0.100 L	Column:	ZB-50

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C12-4,4'-DDT	IS	83.1	5 - 120		08-Feb-21 16:33	1
13C9-Endosulfan Sulfate	IS	81.5	15 - 148		08-Feb-21 16:33	1
13C12-Methoxychlor	IS	85.5	5 - 120		08-Feb-21 16:33	1
13C10-Mirex	IS	76.5	5 - 120		08-Feb-21 16:33	1
13C12-Endrin Aldehyde	IS	42.2	15 - 148		08-Feb-21 16:33	1
13C12-Endrin Ketone	IS	68.9	15 - 148		08-Feb-21 16:33	1

MDL - Method Detection Limit  
RL - Reporting limit

Sample ID: OPR				EPA Method 1699			
<b>Client Data</b> Name: CDIM Engineering Project: LRTC Industrial Stormwater Matrix: Aqueous			<b>Laboratory Data</b> Lab Sample: B1A0122-BS1 QC Batch: B1A0122 Sample Size: 0.100 L Date Extracted: 20-Jan-21 06:04 Column: ZB-50				
Analyte	Amt Found (pg/L)	Spike Amt	% Recovery	Limits	Qualifiers	Analyzed	Dilution
Hexachlorobenzene	20900	20000	105	50-120	B	08-Feb-21 11:42	1
alpha-BHC	21300	20000	107	50-120		08-Feb-21 11:42	1
Lindane (gamma-BHC)	20700	20000	104	50-120		08-Feb-21 11:42	1
beta-BHC	20800	20000	104	50-120		08-Feb-21 11:42	1
delta-BHC	21300	20000	106	50-120		08-Feb-21 11:42	1
Heptachlor	19200	20000	96.1	50-120		08-Feb-21 11:42	1
Aldrin	20000	20000	99.8	50-120		08-Feb-21 11:42	1
Oxychlordane	19800	20000	99.2	50-120		08-Feb-21 11:42	1
cis-Heptachlor Epoxide	20200	20000	101	50-120		08-Feb-21 11:42	1
trans-Heptachlor Epoxide	19700	20000	98.3	50-120		08-Feb-21 11:42	1
trans-Chlordane (gamma)	20300	20000	102	50-120		08-Feb-21 11:42	1
trans-Nonachlor	21000	20000	105	50-120		08-Feb-21 11:42	1
cis-Chlordane (alpha)	22800	20000	114	50-120		08-Feb-21 11:42	1
Endosulfan I (alpha)	18700	20000	93.5	50-120		08-Feb-21 11:42	1
2,4'-DDE	19700	20000	98.5	24-123		08-Feb-21 11:42	1
4,4'-DDE	19600	20000	97.9	50-120		08-Feb-21 11:42	1
Dieldrin	21700	20000	109	50-120		08-Feb-21 11:42	1
Endrin	19900	20000	99.5	50-120		08-Feb-21 11:42	1
cis-Nonachlor	21400	20000	107	50-120		08-Feb-21 11:42	1
Endosulfan II (beta)	20200	20000	101	5-200		08-Feb-21 11:42	1
2,4'-DDD	21900	20000	110	50-120		08-Feb-21 11:42	1
2,4'-DDT	23300	20000	117	50-120		08-Feb-21 11:42	1
4,4'-DDD	21600	20000	108	42-120		08-Feb-21 11:42	1
4,4'-DDT	21100	20000	105	50-120		08-Feb-21 11:42	1
Endosulfan Sulfate	20900	20000	105	50-120		08-Feb-21 11:42	1
4,4'-Methoxychlor	21000	20000	105	50-120		08-Feb-21 11:42	1
Mirex	20100	20000	101	50-120		08-Feb-21 11:42	1
Endrin Aldehyde	19600	20000	98.2	50-134		08-Feb-21 11:42	1
Endrin Ketone	19000	20000	95.2	50-134		08-Feb-21 11:42	1
Labeled Standards	Type		% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C6-Hexachlorobenzene	IS		52.9	5-120		08-Feb-21 11:42	1
13C6-alpha-BHC	IS		85.9	17-141		08-Feb-21 11:42	1
13C6-Lindane (gamma-BHC)	IS		90.4	5-124		08-Feb-21 11:42	1
13C6-beta-BHC	IS		91.8	17-141		08-Feb-21 11:42	1
13C6-delta-BHC	IS		92.2	16-150		08-Feb-21 11:42	1
13C10-Heptachlor	IS		63.4	5-128		08-Feb-21 11:42	1
13C12-Aldrin	IS		71.3	5-126		08-Feb-21 11:42	1
13C10-Oxychlordane	IS		95.9	5-144		08-Feb-21 11:42	1
13C10-cis-Heptachlor Epoxide	IS		105	8-146		08-Feb-21 11:42	1
13C10-trans-Chlordane (gamma)	IS		110	15-144		08-Feb-21 11:42	1
13C10-trans-Nonachlor	IS		103	13-149		08-Feb-21 11:42	1
13C9-Endosulfan I (alpha)	IS		119	5-144		08-Feb-21 11:42	1
13C12-2,4'-DDE	IS		110	26-169		08-Feb-21 11:42	1
13C12-4,4'-DDE	IS		97.8	26-169		08-Feb-21 11:42	1
13C12-Dieldrin	IS		86.0	19-161		08-Feb-21 11:42	1

Sample ID: OPR				EPA Method 1699		
<b>Client Data</b> Name: CDIM Engineering Project: LRTC Industrial Stormwater Matrix: Aqueous		<b>Laboratory Data</b>				
		Lab Sample:	B1A0122-BS1			
		QC Batch:	B1A0122	Date Extracted:	20-Jan-21 06:04	
		Sample Size:	0.100 L	Column:	ZB-50	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C12-Endrin	IS	84.7	20-157		08-Feb-21 11:42	1
13C10-cis-Nonachlor	IS	95.5	17-154		08-Feb-21 11:42	1
13C9-Endosulfan II (beta)	IS	103	5-120		08-Feb-21 11:42	1
13C12-2,4'-DDD	IS	87.8	14-200		08-Feb-21 11:42	1
13C12-2,4'-DDT	IS	86.8	14-200		08-Feb-21 11:42	1
13C12-4,4'-DDD	IS	85.5	14-200		08-Feb-21 11:42	1
13C12-4,4'-DDT	IS	92.4	13-200		08-Feb-21 11:42	1
13C9-Endosulfan Sulfate	IS	89.0	5-144		08-Feb-21 11:42	1
13C12-Methoxychlor	IS	93.6	8-200		08-Feb-21 11:42	1
13C10-Mirex	IS	103	5-138		08-Feb-21 11:42	1
13C12-Endrin Aldehyde	IS	49.2	5-144		08-Feb-21 11:42	1
13C12-Endrin Ketone	IS	76.8	5-144		08-Feb-21 11:42	1

## Sample ID: TS2-E-201213

## EPA Method 1699

Client Data		Laboratory Data			
Name:	CDIM Engineering	Lab Sample:	2002713-01	Date Received:	15-Dec-20 11:13
Project:	LRTC Industrial Stormwater	QC Batch:	B1A0122	Date Extracted:	20-Jan-21
Matrix:	Water	Sample Size:	0.129 L	Column:	ZB-50
Date Collected:	13-Dec-20 09:40				

Analyte	Conc. (pg/L)	MDL	RL	Qualifiers	Analyzed	Dilution
Hexachlorobenzene	143	256	309	J, B	08-Feb-21 18:11	1
alpha-BHC	76.2	95.8	309	J	08-Feb-21 18:11	1
Lindane (gamma-BHC)	90.1	89.7	309	J	08-Feb-21 18:11	1
beta-BHC	ND	107	309		08-Feb-21 18:11	1
delta-BHC	ND	97.4	309		08-Feb-21 18:11	1
Heptachlor	ND	62.5	309		08-Feb-21 18:11	1
Aldrin	ND	94.3	309		08-Feb-21 18:11	1
Oxychlordane	ND	94.3	309		08-Feb-21 18:11	1
cis-Heptachlor Epoxide	ND	69.4	309		08-Feb-21 18:11	1
trans-Heptachlor Epoxide	ND	153	309		08-Feb-21 18:11	1
trans-Chlordane (gamma)	ND	92.8	309		08-Feb-21 18:11	1
trans-Nonachlor	ND	152	309		08-Feb-21 18:11	1
cis-Chlordane (alpha)	ND	147	309		08-Feb-21 18:11	1
Endosulfan I (alpha)	126	1450	1550	J	08-Feb-21 18:11	1
2,4'-DDE	ND	70.2	309		08-Feb-21 18:11	1
4,4'-DDE	115	88.1	309	J	08-Feb-21 18:11	1
Dieldrin	564	76.4	309		08-Feb-21 18:11	1
Endrin	166	108	309	J	08-Feb-21 18:11	1
cis-Nonachlor	ND	89.7	309		08-Feb-21 18:11	1
Endosulfan II (beta)	ND	1340	1550		08-Feb-21 18:11	1
2,4'-DDD	ND	98.9	309		08-Feb-21 18:11	1
2,4'-DDT	ND	134	309		08-Feb-21 18:11	1
4,4'-DDD	ND	136	309		08-Feb-21 18:11	1
4,4'-DDT	ND	141	309		08-Feb-21 18:11	1
Endosulfan Sulfate	ND	1210	1550		08-Feb-21 18:11	1
4,4'-Methoxychlor	ND	1320	1550		08-Feb-21 18:11	1
Mirex	ND	97.4	309		08-Feb-21 18:11	1
Endrin Aldehyde	ND	1130	1550		08-Feb-21 18:11	1
Endrin Ketone	376	1140	1550	J	08-Feb-21 18:11	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C6-Hexachlorobenzene	IS	74.0	5 - 120		08-Feb-21 18:11	1
13C6-alpha-BHC	IS	78.6	32 - 130		08-Feb-21 18:11	1
13C6-Lindane (gamma-BHC)	IS	76.8	11 - 120		08-Feb-21 18:11	1
13C6-beta-BHC	IS	74.7	32 - 130		08-Feb-21 18:11	1
13C6-delta-BHC	IS	80.5	36 - 137		08-Feb-21 18:11	1
13C10-Heptachlor	IS	69.5	5 - 120		08-Feb-21 18:11	1
13C12-Aldrin	IS	76.1	5 - 120		08-Feb-21 18:11	1
13C10-Oxychlordane	IS	95.7	23 - 135		08-Feb-21 18:11	1
13C10-cis-Heptachlor Epoxide	IS	101	27 - 137		08-Feb-21 18:11	1
13C10-trans-Chlordane (gamma)	IS	86.0	21 - 132		08-Feb-21 18:11	1
13C10-trans-Nonachlor	IS	83.5	14 - 136		08-Feb-21 18:11	1
13C9-Endosulfan I (alpha)	IS	111	15 - 148		08-Feb-21 18:11	1
13C12-2,4'-DDE	IS	108	47 - 160		08-Feb-21 18:11	1
13C12-4,4'-DDE	IS	102	47 - 160		08-Feb-21 18:11	1
13C12-Dieldrin	IS	89.7	40 - 151		08-Feb-21 18:11	1
13C12-Endrin	IS	78.7	35 - 155		08-Feb-21 18:11	1
13C10-cis-Nonachlor	IS	73.2	36 - 139		08-Feb-21 18:11	1
13C9-Endosulfan II (beta)	IS	87.9	5 - 122		08-Feb-21 18:11	1
13C12-2,4'-DDD	IS	87.3	5 - 199		08-Feb-21 18:11	1
13C12-2,4'-DDT	IS	77.2	5 - 199		08-Feb-21 18:11	1
13C12-4,4'-DDD	IS	77.5	5 - 120		08-Feb-21 18:11	1



Sample ID: TS2-E-201213

EPA Method 1699

Client Data		Laboratory Data			
Name:	CDIM Engineering	Lab Sample:	2002713-01	Date Received:	15-Dec-20 11:13
Project:	LRTC Industrial Stormwater	QC Batch:	B1A0122	Date Extracted:	20-Jan-21
Matrix:	Water	Sample Size:	0.129 L	Column:	ZB-50
Date Collected:	13-Dec-20 09:40				

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C12-4,4'-DDT	IS	83.3	5 - 120		08-Feb-21 18:11	1
13C9-Endosulfan Sulfate	IS	83.3	15 - 148		08-Feb-21 18:11	1
13C12-Methoxychlor	IS	89.8	5 - 120		08-Feb-21 18:11	1
13C10-Mirex	IS	76.3	5 - 120		08-Feb-21 18:11	1
13C12-Endrin Aldehyde	IS	48.7	15 - 148		08-Feb-21 18:11	1
13C12-Endrin Ketone	IS	69.2	15 - 148		08-Feb-21 18:11	1

MDL - Method Detection Limit  
RL - Reporting limit

## DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
CRS	Cleanup Recovery Standard
D	Dilution
DL	Detection Limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
IS	Internal Standard
J	The amount detected is below the Reporting Limit/LOQ
K	EMPC (specific projects only)
LOD	Limit of Detection
LOQ	Limit of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
MDL	Method Detection Limit
NA	Not applicable
ND	Not Detected
OPR	Ongoing Precision and Recovery sample
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
RL	Reporting Limit
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

### Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-23
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Massachusetts Department of Environmental Protection	N/A
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718-B
New Jersey Department of Environmental Protection	190001
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	016
Texas Commission on Environmental Quality	T104704189-19-10
Vermont Department of Health	VT-4042
Virginia Department of General Services	10272
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

## NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	Method
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	Method
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	Method
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A





# Sample Log-In Checklist

Page # 1 of 1

Vista Work Order #:

2002713

TAT

std

Samples Arrival:	Date/Time		Initials:		Location:		
	<u>12/15/20 11:13</u>		<u>WWS</u>		<u>WR-2</u>		
Delivered By:	<u>FedEx</u>	UPS	On Trac	GLS	DHL	Hand Delivered	Other
Preservation:	<u>Ice</u>	Blue Ice		Techni Ice	Dry Ice	None	
Temp °C:	<u>1.6</u>	(uncorrected)	Probe used: Y / <u>N</u>		Thermometer ID: <u>IR-3</u>		
Temp °C:	<u>1.6</u>	(corrected)					

	YES	NO	NA
Shipping Container(s) Intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shipping Custody Seals Intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Airbill <u>                    </u> Trk # <u>7813 9337 3891</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shipping Documentation Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shipping Container	<u>Vista</u>	Client	<u>Retain</u>
Chain of Custody / Sample Documentation Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chain of Custody / Sample Documentation Complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Holding Time Acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Logged In:	Date/Time		Initials:		Location:	
	<u>12/15/20 1154</u>		<u>WWS</u>		<u>WR-2</u>	
					Shelf/Rack: <u>B-1, C2</u>	
COC Anomaly/Sample Acceptance Form completed?					<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments: \*TAPE Broken upon Receipt.

# CoC/Label Reconciliation Report WO# 2002713

LabNumber	CoC Sample ID	Sample Alias	Sample Date/Time	Container	BaseMatrix	Sample Comments
2002713-01	A TS2-E-201213		13-Dec-20 09:40	Amber Glass NM Bottle, 1L	Aqueous	
2002713-01	B TS2-E-201213		13-Dec-20 09:40	Amber Glass NM Bottle, 1L	Aqueous	
2002713-01	C TS2-E-201213		13-Dec-20 09:40	Amber Glass NM Bottle, 1L	Aqueous	

Checkmarks indicate that information on the COC reconciled with the sample label.  
Any discrepancies are noted in the following columns.

	Yes	No	NA	Comments:
Sample Container Intact?	✓			
Sample Custody Seals Intact?			✓	
Adequate Sample Volume?	✓			
Container Type Appropriate for Analysis(es)	✓			
Preservation Documented: Na2S2O3 Trizma <del>None</del> Other		✓	✓	
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			✓	

Verified by/Date: WUS 12/15/20



## LEVEL 2 DATA REVIEW SUMMARY

**Project Name:** LRTC 2020-2021 Storm Water

**Project Number:** 101-006-LRTC, Task 1

**Analyses:** EPA 1699

**Lab Order Number:** 2002713

**Sample Dates:** 12/13/20

Laboratory QC Criteria	Yes	No	NA
Have all samples been extracted/analyzed within holding times?	X		
Are detection and reporting limits acceptable?	X		
Are all surrogate recoveries in all samples within QC limits?	X		
Are all LCS (BS) recoveries within QC limits?	X		
Are all MS/MSD recoveries and RPDs within QC limits?			X
Are method blanks free of contamination?		X <sup>1</sup>	
Are travel blanks free of contamination?			X
Are field/equipment blanks free of contamination?			X
Are all compounds present in either the sample or duplicate also present in the other?			X
Are all RPDs between sample and duplicate acceptable?			X

### Flags:

Sample ID	Compound	Det Flag	Lab Quals	Val Quals	Final Quals	Reportable Result?
TS2-E-201213	Hexachloro-benzene	--	J,B	--	J,B	Yes
	alpha-BHC	--	J	--	J	Yes
	Lindane (gamma-BHC)	--	J	--	J	Yes
	Endosulfan I (alpha)	--	J	--	J	Yes
	4,4'-DDE	--	J	--	J	Yes
	Endrin	--	J	--	J	Yes
	Endrin Ketone	--	J	--	J	Yes

B = the compound was also detected in the method blank

J = identification of the analyte is acceptable; reported value is an estimate (result is between laboratory detection and reporting limits)

NOTE: Laboratory invoices should not be approved for payment until this review has been completed and all issues resolved.



**Comments:**

1. Hexachlorobenzene was detected in the method blank at a concentration of 45.4 (J) pg/L.  
Sample result for hexachlorobenzene was B-flagged by the lab.

Reviewed by: 

Date: 02/11/21

December 24, 2020

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

## CDIM Engineering - San Francisco, CA

Sample Delivery Group: L1296850  
Samples Received: 12/15/2020  
Project Number:  
Description: LRTC Industrial Stormwater  
  
Report To: Bryan Starks  
45 Polk Street  
3rd Floor  
San Francisco, CA 94102

Entire Report Reviewed By:



Jennifer Gambill  
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

**Pace Analytical National**

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 [www.pacenational.com](http://www.pacenational.com)

ACCOUNT:

CDIM Engineering - San Francisco, CA

PROJECT:

SDG:

L1296850

DATE/TIME:

12/24/20 11:23

PAGE:

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Cp: Cover Page	1	<sup>1</sup> Cp
Tc: Table of Contents	2	
Ss: Sample Summary	3	<sup>2</sup> Tc
Cn: Case Narrative	4	
Sr: Sample Results	5	<sup>3</sup> Ss
TS1-E-201213 L1296850-01	5	
TS2-E-201213 L1296850-02	6	<sup>4</sup> Cn
TS4-E-201213 L1296850-03	7	<sup>5</sup> Sr
TSX-E-201213 L1296850-04	8	
Qc: Quality Control Summary	9	<sup>6</sup> Qc
Gravimetric Analysis by Method 2540 D-2011	9	
Wet Chemistry by Method 1664A	10	<sup>7</sup> Gl
Wet Chemistry by Method 4500H+ B-2011	11	<sup>8</sup> Al
Metals (ICPMS) by Method 200.8	12	
Gl: Glossary of Terms	13	<sup>9</sup> Sc
Al: Accreditations & Locations	14	
Sc: Sample Chain of Custody	15	



# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



## TS1-E-201213 L1296850-01 WW

Collected by  
AH

Collected date/time  
12/13/20 09:30

Received date/time  
12/15/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1592536	1	12/15/20 23:38	12/16/20 01:19	MML	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1594082	1	12/18/20 09:00	12/18/20 13:26	MBP	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1595101	1	12/22/20 09:46	12/22/20 09:46	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1594804	1	12/21/20 06:59	12/22/20 21:12	LD	Mt. Juliet, TN

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

## TS2-E-201213 L1296850-02 WW

Collected by  
AH

Collected date/time  
12/13/20 09:40

Received date/time  
12/15/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1592536	1	12/15/20 23:38	12/16/20 01:19	MML	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1594082	1	12/18/20 09:00	12/18/20 13:26	MBP	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1595101	1	12/22/20 09:46	12/22/20 09:46	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1594804	1	12/21/20 06:59	12/22/20 21:15	LD	Mt. Juliet, TN

## TS4-E-201213 L1296850-03 WW

Collected by  
AH

Collected date/time  
12/13/20 10:58

Received date/time  
12/15/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1592536	1	12/15/20 23:38	12/16/20 01:19	MML	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1594082	1	12/18/20 09:00	12/18/20 13:26	MBP	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1595101	1	12/22/20 09:46	12/22/20 09:46	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1594804	1	12/21/20 06:59	12/22/20 21:18	LD	Mt. Juliet, TN

## TSX-E-201213 L1296850-04 WW

Collected by  
AH

Collected date/time  
12/13/20 10:58

Received date/time  
12/15/20 09:30

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1592536	1	12/15/20 23:38	12/16/20 01:19	MML	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1594082	1	12/18/20 09:00	12/18/20 13:26	MBP	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1595101	1	12/22/20 09:46	12/22/20 09:46	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1594804	1	12/21/20 06:59	12/22/20 19:39	LD	Mt. Juliet, TN

ACCOUNT:

CDIM Engineering - San Francisco, CA

PROJECT:

SDG:

L1296850

DATE/TIME:

12/24/20 11:23

PAGE:

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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jennifer Gambill  
Project Manager

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	15.3		0.350	2.50	1	12/16/2020 01:19	<a href="#">WG1592536</a>

1 Cp

2 Tc

3 Ss

4 Cn

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	U		1.21	5.21	1	12/18/2020 13:26	<a href="#">WG1594082</a>

5 Sr

## Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.42	<a href="#">T8</a>	1	12/22/2020 09:46	<a href="#">WG1595101</a>

6 Qc

7 Gl

## Sample Narrative:

L1296850-01 WG1595101: 7.42 at 18.7C

8 Al

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	0.133		0.0470	0.100	1	12/22/2020 21:12	<a href="#">WG1594804</a>
Iron	0.367		0.0447	0.100	1	12/22/2020 21:12	<a href="#">WG1594804</a>
Lead	0.00391		0.000513	0.00200	1	12/22/2020 21:12	<a href="#">WG1594804</a>
Zinc	0.0478		0.00796	0.0200	1	12/22/2020 21:12	<a href="#">WG1594804</a>

9 Sc



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	5.90		0.350	2.50	1	12/16/2020 01:19	<a href="#">WG1592536</a>

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	U		1.21	5.21	1	12/18/2020 13:26	<a href="#">WG1594082</a>

## Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.24	<a href="#">T8</a>	1	12/22/2020 09:46	<a href="#">WG1595101</a>

## Sample Narrative:

L1296850-02 WG1595101: 7.24 at 18.7C

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	U		0.0470	0.100	1	12/22/2020 21:15	<a href="#">WG1594804</a>
Iron	0.0722	<a href="#">J</a>	0.0447	0.100	1	12/22/2020 21:15	<a href="#">WG1594804</a>
Lead	0.000658	<a href="#">J</a>	0.000513	0.00200	1	12/22/2020 21:15	<a href="#">WG1594804</a>
Zinc	0.0735		0.00796	0.0200	1	12/22/2020 21:15	<a href="#">WG1594804</a>



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Suspended Solids	0.400	J	0.350	2.50	1	12/16/2020 01:19	<a href="#">WG1592536</a>

1 Cp

2 Tc

## Wet Chemistry by Method 1664A

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	U		1.22	5.26	1	12/18/2020 13:26	<a href="#">WG1594082</a>

3 Ss

4 Cn

## Wet Chemistry by Method 4500H+ B-2011

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.48	T8	1	12/22/2020 09:46	<a href="#">WG1595101</a>

5 Sr

6 Qc

## Sample Narrative:

L1296850-03 WG1595101: 7.48 at 18.6C

7 Gl

8 Al

## Metals (ICPMS) by Method 200.8

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Aluminum	U		0.0470	0.100	1	12/22/2020 21:18	<a href="#">WG1594804</a>
Iron	0.0459	J	0.0447	0.100	1	12/22/2020 21:18	<a href="#">WG1594804</a>
Lead	0.000710	J	0.000513	0.00200	1	12/22/2020 21:18	<a href="#">WG1594804</a>
Zinc	0.0103	J	0.00796	0.0200	1	12/22/2020 21:18	<a href="#">WG1594804</a>

9 Sc



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Suspended Solids	U		0.350	2.50	1	12/16/2020 01:19	<a href="#">WG1592536</a>

1 Cp

2 Tc

3 Ss

4 Cn

## Wet Chemistry by Method 1664A

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	U	<a href="#">J3 J6</a>	1.26	5.44	1	12/18/2020 13:26	<a href="#">WG1594082</a>

5 Sr

6 Qc

## Wet Chemistry by Method 4500H+ B-2011

Analyte	Result su	Qualifier	Dilution	Analysis date / time	Batch
pH	7.59	<a href="#">T8</a>	1	12/22/2020 09:46	<a href="#">WG1595101</a>

7 Gl

8 Al

## Sample Narrative:

L1296850-04 WG1595101: 7.59 at 18.5C

## Metals (ICPMS) by Method 200.8

Analyte	Result mg/l	Qualifier	MDL mg/l	RDL mg/l	Dilution	Analysis date / time	Batch
Aluminum	U		0.0470	0.100	1	12/22/2020 19:39	<a href="#">WG1594804</a>
Iron	U		0.0447	0.100	1	12/22/2020 19:39	<a href="#">WG1594804</a>
Lead	0.000865	<a href="#">J</a>	0.000513	0.00200	1	12/22/2020 19:39	<a href="#">WG1594804</a>
Zinc	0.0122	<a href="#">J</a>	0.00796	0.0200	1	12/22/2020 19:39	<a href="#">WG1594804</a>

9 Sc



Method Blank (MB)

(MB) R3604085-1 12/16/20 01:19

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Suspended Solids	U		0.350	2.50

Laboratory Control Sample (LCS)

(LCS) R3604085-2 12/16/20 01:19

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Suspended Solids	773	788	102	85.7-114	

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc



Method Blank (MB)

(MB) R3605133-1 12/18/20 10:35

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Oil & Grease (Hexane Extr)	U		1.16	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3605133-2 12/18/20 10:35 • (LCSD) R3605133-3 12/18/20 10:35

	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	%	%	%			%	%
Oil & Grease (Hexane Extr)	40.0	38.2	33.5	95.5	83.8	78.0-114			13.1	20

L1296850-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1296850-04 12/18/20 13:26 • (MS) R3605133-4 12/18/20 13:26 • (MSD) R3605133-5 12/18/20 13:26

	Spike Amount	Original Result	MS Result	MSD Result	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
Analyte	mg/l	mg/l	mg/l	mg/l	%	%		%			%	%
Oil & Grease (Hexane Extr)	40.0	U	32.1	23.5	80.3	58.6	1	78.0-114		J3 J6	31.2	18

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc

Laboratory Control Sample (LCS)

(LCS) R3606109-1 12/22/20 09:46

Analyte	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	<u>LCS Qualifier</u>
	su	su	%	%	
pH	10.0	10.0	100	99.0-101	

Sample Narrative:

LCS: 10.04 at 18.5C

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc



Method Blank (MB)

(MB) R3606389-1 12/22/20 19:32

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum	U		0.0470	0.100
Iron	U		0.0447	0.100
Lead	U		0.000513	0.00200
Zinc	U		0.00796	0.0200

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Laboratory Control Sample (LCS)

(LCS) R3606389-2 12/22/20 19:36

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum	5.00	4.94	98.7	85.0-115	
Iron	5.00	5.18	104	85.0-115	
Lead	0.0500	0.0521	104	85.0-115	
Zinc	0.500	0.513	103	85.0-115	

L1296850-04 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1296850-04 12/22/20 19:39 • (MS) R3606389-4 12/22/20 19:45 • (MSD) R3606389-5 12/22/20 19:49

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	5.00	U	4.81	4.87	96.3	97.5	1	70.0-130			1.25	20
Iron	5.00	U	4.99	5.15	99.8	103	1	70.0-130			3.04	20
Lead	0.0500	0.000865	0.0472	0.0514	92.7	101	1	70.0-130			8.47	20
Zinc	0.500	0.0122	0.504	0.517	98.4	101	1	70.0-130			2.60	20

L1296941-03 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1296941-03 12/22/20 19:52 • (MS) R3606389-6 12/22/20 19:55 • (MSD) R3606389-7 12/22/20 19:58

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	5.00	0.715	5.87	5.88	103	103	1	70.0-130			0.176	20
Iron	5.00	2.42	7.78	7.56	107	103	1	70.0-130			2.87	20
Lead	0.0500	0.0275	0.0805	0.0805	106	106	1	70.0-130			0.0481	20
Zinc	0.500	0.172	0.703	0.687	106	103	1	70.0-130			2.31	20



## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

### Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

### Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

\* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

\* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

## State Accreditations

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico <sup>1</sup>	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina <sup>1</sup>	DW21704
Georgia	NELAP	North Carolina <sup>3</sup>	41
Georgia <sup>1</sup>	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky <sup>1 6</sup>	KY90010	South Carolina	84004
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1 4</sup>	2006
Louisiana <sup>1</sup>	LA180010	Texas	T104704245-20-18
Maine	TN00003	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	TN00003
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	460132
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA

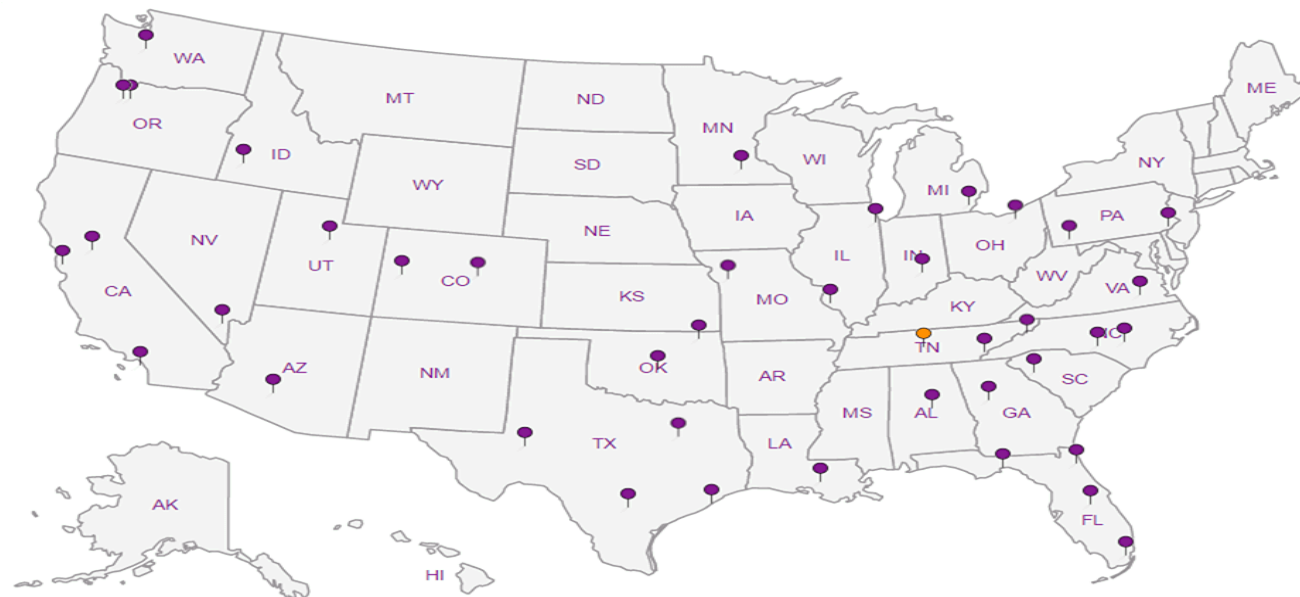
## Third Party Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>6</sup> Wastewater n/a Accreditation not applicable

## Our Locations

Pace National has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. Pace National performs all testing at our central laboratory.







41296850

[illegible]

Fedex: 4882 8629 8781-7165

1.2

$7+1=8$   

POCSI

**Pace Analytical National Center for Testing & Innovation  
Cooler Receipt Form**

Client: <i>CDI ENG SFGA</i>		11296850	
Cooler Received/Opened On: 12 / 15 / 20		Temperature:	1.24.7
Received By: Olivia Turner			
Signature: <i>Olivia Turner</i>			
<b>Receipt Check List</b>			
	<b>NP</b>	<b>Yes</b>	<b>No</b>
COC Seal Present / Intact?		/	
COC Signed / Accurate?		/	
Bottles arrive intact?		/	
Correct bottles used?		/	
Sufficient volume sent?		/	
If Applicable			
VOA Zero headspace?			
Preservation Correct / Checked?		/	



## LEVEL 2 DATA REVIEW SUMMARY

**Project Name:** LRTC 2020-2021 Storm Water

**Project Number:** 101-005-LRTC, Task 1

**Analyses:** EPA 200.8, 1664A, EPA 9040C; SM2540D

**Lab Order Number:** L1296850

**Sample Dates:** 12/13/20

Laboratory QC Criteria	Yes	No	NA
Have all samples been extracted/analyzed within holding times?		X <sup>1</sup>	
Are detection and reporting limits acceptable?	X		
Are all surrogate recoveries in all samples within QC limits?			X
Are all LCS (BS) recoveries within QC limits?	X		
Are all MS/MSD recoveries and RPDs within QC limits?		X <sup>2</sup>	
Are method blanks free of contamination?	X		
Are travel blanks free of contamination?			X
Are field/equipment blanks free of contamination?			X
Are all compounds present in either the sample or duplicate also present in the other?	X		
Are all RPDs between sample and duplicate acceptable?	X		

### Flags:

Sample ID	Compound	Det Flag	Lab Quals	Val Quals	Final Quals	Reportable Result?
TS1-E-201213 TS2-E-201213 TS4-E-201213	pH	--	T8	--	none	Yes
TS2-E-201213	Iron	J	--	--	J	Yes
TS2-E-201213	Lead	J	--	--	J	Yes
TSX-E-201213	Oil & Grease	U	J3 J6	--	UJ	Yes
TSX-E-201213	Lead	J	--	--	J	Yes
TSX-E-201213	Zinc	J	--	--	J	Yes
TS4-E-201213	TSS	J	--	--	J	Yes
TS4-E-201213	Iron	J	--	--	J	Yes
TS4-E-201213	Lead	J	--	--	J	Yes
TS4-E-201213	Zinc	J	--	--	J	Yes

NOTE: Laboratory invoices should not be approved for payment until this review has been completed and all issues resolved.



J = identification of the analyte is acceptable; reported value is an estimate (result is between laboratory detection and reporting limits)

J3 = the associated batch QC was outside the established quality control range for precision

J6 = the sample matrix interfered with the ability to make any accurate determination; spike value is low

T8 = samples received past/too close to holding time expiration

**Comments:**

1. pH not analyzed within 15 minutes of sampling, however analyzed upon receipt by laboratory.
2. The matrix spike duplicate recovery for oil and grease (on primary sample TS4-E) was low, however primary sample result was non-detect. Final data flag of UJ for TS4-E sample only, as matrix for other samples in set is not necessarily consistent.

Reviewed by:

A handwritten signature in blue ink, appearing to be "M. J.", written over a horizontal line.

Date: 12/29/20



February 18, 2021

**Vista Work Order No. 2101197**

Mr. Bryan Starks  
CDIM Engineering  
45 Polk Street, 3rd Floor  
San Francisco, CA 94102


Dear Mr. Starks,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on January 26, 2021 under your Project Name 'LRTC Industrial Stormwater'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at [mmaier@vista-analytical.com](mailto:mmaier@vista-analytical.com).

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

A handwritten signature in black ink, appearing to read "Martha Maier", followed by the word "for" in a standard font.

Martha Maier  
Laboratory Director



*Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.*

## Vista Work Order No. 2101197

### Case Narrative

#### Sample Condition on Receipt:

One water sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology. The sample was received in good condition and within the method temperature requirements.

#### Analytical Notes:

##### EPA Method 1699

The three bottles of the sample were composited prior to an aliquot taken for extraction and analyzed for chlorinated pesticides by EPA Method 1699 using a ZB-50 GC column.

##### Holding Times

The sample was extracted and analyzed within the method hold times.

##### Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected above the sample quantitation limits in the Method Blank. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries outside the method acceptance criteria are listed in the table below:

#### QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
2101197-01	TS2-I-210122	EPA Method 1699	13C12-4,4'-DDE	H	38.6
2101197-01	TS2-I-210122	EPA Method 1699	13C10-cis-Nonachlor	H	25.1
2101197-01	TS2-I-210122	EPA Method 1699	13C12-Endrin Aldehyde	H	14.6
2101197-01	TS2-I-210122	EPA Method 1699	13C12-Endrin Ketone	H	12.2

H = Recovery was outside laboratory acceptance criteria.



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# Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2101197-01	TS2-I-210122	22-Jan-21 16:41	26-Jan-21 11:45	Amber Glass NM Bottle, 1L Amber Glass NM Bottle, 1L Amber Glass NM Bottle, 1L

## **ANALYTICAL RESULTS**

Sample ID: Method Blank				EPA Method 1699		
<b>Client Data</b> Name: CDIM Engineering Project: LRTC Industrial Stormwater Matrix: Aqueous			<b>Laboratory Data</b> Lab Sample: B1A0186-BLK1 QC Batch: B1A0186      Date Extracted: 29-Jan-21 Sample Size: 1.00 L      Column: ZB-50			
Analyte	Conc. (pg/L)	MDL	RL	Qualifiers	Analyzed	Dilution
Hexachlorobenzene	4.45	33.1	40.0	J	08-Feb-21 14:56	1
alpha-BHC	ND	12.4	40.0		08-Feb-21 14:56	1
Lindane (gamma-BHC)	ND	11.6	40.0		08-Feb-21 14:56	1
beta-BHC	ND	13.9	40.0		08-Feb-21 14:56	1
delta-BHC	ND	12.6	40.0		08-Feb-21 14:56	1
Heptachlor	ND	8.08	40.0		08-Feb-21 14:56	1
Aldrin	ND	12.2	40.0		08-Feb-21 14:56	1
Oxychlordane	ND	12.2	40.0		08-Feb-21 14:56	1
cis-Heptachlor Epoxide	ND	8.98	40.0		08-Feb-21 14:56	1
trans-Heptachlor Epoxide	ND	19.8	40.0		08-Feb-21 14:56	1
trans-Chlordane (gamma)	ND	12.0	40.0		08-Feb-21 14:56	1
trans-Nonachlor	ND	19.6	40.0		08-Feb-21 14:56	1
cis-Chlordane (alpha)	ND	19.0	40.0		08-Feb-21 14:56	1
Endosulfan I (alpha)	ND	187	200		08-Feb-21 14:56	1
2,4'-DDE	ND	9.08	40.0		08-Feb-21 14:56	1
4,4'-DDE	ND	11.4	40.0		08-Feb-21 14:56	1
Dieldrin	ND	9.89	40.0		08-Feb-21 14:56	1
Endrin	ND	14.0	40.0		08-Feb-21 14:56	1
cis-Nonachlor	ND	11.6	40.0		08-Feb-21 14:56	1
Endosulfan II (beta)	ND	174	200		08-Feb-21 14:56	1
2,4'-DDD	ND	12.8	40.0		08-Feb-21 14:56	1
2,4'-DDT	ND	17.4	40.0		08-Feb-21 14:56	1
4,4'-DDD	ND	17.6	40.0		08-Feb-21 14:56	1
4,4'-DDT	ND	18.2	40.0		08-Feb-21 14:56	1
Endosulfan Sulfate	ND	156	200		08-Feb-21 14:56	1
4,4'-Methoxychlor	ND	171	200		08-Feb-21 14:56	1
Mirex	ND	12.6	40.0		08-Feb-21 14:56	1
Endrin Aldehyde	ND	146	200		08-Feb-21 14:56	1
Endrin Ketone	ND	147	200		08-Feb-21 14:56	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C6-Hexachlorobenzene	IS	78.5	5 - 120		08-Feb-21 14:56	1
13C6-alpha-BHC	IS	87.3	32 - 130		08-Feb-21 14:56	1
13C6-Lindane (gamma-BHC)	IS	86.0	11 - 120		08-Feb-21 14:56	1
13C6-beta-BHC	IS	80.5	32 - 130		08-Feb-21 14:56	1
13C6-delta-BHC	IS	84.4	36 - 137		08-Feb-21 14:56	1
13C10-Heptachlor	IS	80.9	5 - 120		08-Feb-21 14:56	1
13C12-Aldrin	IS	92.2	5 - 120		08-Feb-21 14:56	1
13C10-Oxychlordane	IS	101	23 - 135		08-Feb-21 14:56	1
13C10-cis-Heptachlor Epoxide	IS	105	27 - 137		08-Feb-21 14:56	1
13C10-trans-Chlordane (gamma)	IS	92.7	21 - 132		08-Feb-21 14:56	1
13C10-trans-Nonachlor	IS	88.9	14 - 136		08-Feb-21 14:56	1
13C9-Endosulfan I (alpha)	IS	111	15 - 148		08-Feb-21 14:56	1
13C12-2,4'-DDE	IS	111	47 - 160		08-Feb-21 14:56	1
13C12-4,4'-DDE	IS	105	47 - 160		08-Feb-21 14:56	1
13C12-Dieldrin	IS	94.8	40 - 151		08-Feb-21 14:56	1
13C12-Endrin	IS	80.4	35 - 155		08-Feb-21 14:56	1
13C10-cis-Nonachlor	IS	80.9	36 - 139		08-Feb-21 14:56	1
13C9-Endosulfan II (beta)	IS	90.7	5 - 122		08-Feb-21 14:56	1
13C12-2,4'-DDD	IS	94.4	5 - 199		08-Feb-21 14:56	1
13C12-2,4'-DDT	IS	88.3	5 - 199		08-Feb-21 14:56	1
13C12-4,4'-DDD	IS	87.8	5 - 120		08-Feb-21 14:56	1

Sample ID: Method Blank				EPA Method 1699		
<b>Client Data</b> Name: CDIM Engineering Project: LRTC Industrial Stormwater Matrix: Aqueous			<b>Laboratory Data</b>			
			Lab Sample: B1A0186-BLK1			
			QC Batch: B1A0186		Date Extracted: 29-Jan-21	
			Sample Size: 1.00 L		Column: ZB-50	
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C12-4,4'-DDT	IS	94.2	5 - 120		08-Feb-21 14:56	1
13C9-Endosulfan Sulfate	IS	92.8	15 - 148		08-Feb-21 14:56	1
13C12-Methoxychlor	IS	91.5	5 - 120		08-Feb-21 14:56	1
13C10-Mirex	IS	83.0	5 - 120		08-Feb-21 14:56	1
13C12-Endrin Aldehyde	IS	60.3	15 - 148		08-Feb-21 14:56	1
13C12-Endrin Ketone	IS	74.4	15 - 148		08-Feb-21 14:56	1

MDL - Method Detection Limit  
RL - Reporting limit

Sample ID: OPR				EPA Method 1699			
<b>Client Data</b> Name: CDIM EnKineerinK Project: LRTC Industrial Stormwater Matrix: A5ueous			<b>Laboratory Data</b> Lab Sample: B1A0186-BS1 QC Batch: B1A0186 Sample Size: 1g00 L Date Extracted: q2-9an-q1 0Z:JZ Column: . B-Z0				
Analyte	Amt Found (pg/L)	Spike Amt	% Recovery	Limits	Qualifiers	Analyzed	Dilution
Hexachlorobenzene	10q0	1000	10q	Z0-1q0	B	08-3eb-q1 1J:12	1
alpha-BHC	1010	1000	101	Z0-1q0		08-3eb-q1 1J:12	1
Lindane 4Kamma-BHCF	1000	1000	100	Z0-1q0		08-3eb-q1 1J:12	1
beta-BHC	221	1000	22g	Z0-1q0		08-3eb-q1 1J:12	1
delta-BHC	10q0	1000	10q	Z0-1q0		08-3eb-q1 1J:12	1
Heptachlor	26(	1000	26g	Z0-1q0		08-3eb-q1 1J:12	1
Aldrin	26q	1000	26g	Z0-1q0		08-3eb-q1 1J:12	1
) xQchlordan	2Z2	1000	2Zg	Z0-1q0		08-3eb-q1 1J:12	1
cis-Heptachlor Epoxide	28q	1000	28g	Z0-1q0		08-3eb-q1 1J:12	1
trans-Heptachlor Epoxide	1010	1000	101	Z0-1q0		08-3eb-q1 1J:12	1
trans-Chlordane 4KammaF	228	1000	22g	Z0-1q0		08-3eb-q1 1J:12	1
trans-Nonachlor	2ZJ	1000	2Zg	Z0-1q0		08-3eb-q1 1J:12	1
cis-Chlordane 4alphaF	1060	1000	106	Z0-1q0		08-3eb-q1 1J:12	1
Endosulyan I 4alphaF	212	1000	21g	Z0-1q0		08-3eb-q1 1J:12	1
qf7,-DDE	2Z8	1000	2Zg	q7-1qJ		08-3eb-q1 1J:12	1
7f7,-DDE	260	1000	26g	Z0-1q0		08-3eb-q1 1J:12	1
Dieldrin	1010	1000	101	Z0-1q0		08-3eb-q1 1J:12	1
Endrin	10q0	1000	10q	Z0-1q0		08-3eb-q1 1J:12	1
cis-Nonachlor	1060	1000	106	Z0-1q0		08-3eb-q1 1J:12	1
Endosulyan II 4betaF	10J0	1000	10J	Z-q00		08-3eb-q1 1J:12	1
qf7,-DDD	10J0	1000	10J	Z0-1q0		08-3eb-q1 1J:12	1
qf7,-DDT	1110	1000	111	Z0-1q0		08-3eb-q1 1J:12	1
7f7,-DDD	10Z0	1000	10Z	7q-1q0		08-3eb-q1 1J:12	1
7f7,-DDT	266	1000	26g	Z0-1q0		08-3eb-q1 1J:12	1
Endosulyan Sulyate	266	1000	26g	Z0-1q0		08-3eb-q1 1J:12	1
7f7,-MethoxQhlor	1000	1000	100	Z0-1q0		08-3eb-q1 1J:12	1
Mirex	1000	1000	100	Z0-1q0		08-3eb-q1 1J:12	1
Endrin AldehQle	26q	1000	26g	Z0-1J7		08-3eb-q1 1J:12	1
Endrin ' etone	286	1000	28g	Z0-1J7		08-3eb-q1 1J:12	1
Labeled Standards	Type		% Recovery	Limits	Qualifiers	Analyzed	Dilution
1JC6-Hexachlorobenzene	IS		(0g	Z1q0		08-3eb-q1 1J:12	1
1JC6-alpha-BHC	IS		81g	1(-171		08-3eb-q1 1J:12	1
1JC6-Lindane 4Kamma-BHCF	IS		8qg	Z1q7		08-3eb-q1 1J:12	1
1JC6-beta-BHC	IS		80g	1(-171		08-3eb-q1 1J:12	1
1JC6-delta-BHC	IS		87g	16-1Z0		08-3eb-q1 1J:12	1
1JC10-Heptachlor	IS		(8g	Z1q8		08-3eb-q1 1J:12	1
1JC1q-Aldrin	IS		86g	Z1q6		08-3eb-q1 1J:12	1
1JC10-) xQchlordan	IS		10(	Z177		08-3eb-q1 1J:12	1
1JC10-cis-Heptachlor Epoxide	IS		108	8-176		08-3eb-q1 1J:12	1
1JC10-trans-Chlordane 4KammaF	IS		28g	1Z177		08-3eb-q1 1J:12	1
1JC10-trans-Nonachlor	IS		2Zg	1J-172		08-3eb-q1 1J:12	1
1JC2-Endosulyan I 4alphaF	IS		118	Z177		08-3eb-q1 1J:12	1
1JC1q-qf7,-DDE	IS		10(	q6-162		08-3eb-q1 1J:12	1
1JC1q-7f7,-DDE	IS		10q	q6-162		08-3eb-q1 1J:12	1
1JC1q-Dieldrin	IS		26g	12-161		08-3eb-q1 1J:12	1

Sample ID: OPR				EPA Method 1699		
<b>Client Data</b> Name: CDIM EnKineerinK Project: LRTC Industrial Stormwater Matrix: A5ueous		<b>Laboratory Data</b>				
		Lab Sample: B1A0186-BS1				
		QC Batch: B1A0186	Date Extracted: q2-9an-q1 0Z:JZ			
		Sample Size: 1g00 L	Column: . B-Z0			
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
1JC1q-Endrin	IS	8( g)	q0-1Z(		08-3eb-q1 1J:12	1
1JC10-cis-Nonachlor	IS	8Zg	1(-1Z7		08-3eb-q1 1J:12	1
1JC2-Endosulyan II 4betaF	IS	2Zg	Z 1q0		08-3eb-q1 1J:12	1
1JC1q-qf7,-DDD	IS	26g	17-q00		08-3eb-q1 1J:12	1
1JC1q-qf7,-DDT	IS	20g	17-q00		08-3eb-q1 1J:12	1
1JC1q-7f7,-DDD	IS	82g	17-q00		08-3eb-q1 1J:12	1
1JC1q-7f7,-DDT	IS	10q	1J-q00		08-3eb-q1 1J:12	1
1JC2-Endosulyan Sulyate	IS	2qg	Z 177		08-3eb-q1 1J:12	1
1JC1q-MethoxOchlor	IS	2( g	8-q00		08-3eb-q1 1J:12	1
1JC10-Mirex	IS	86g	Z 1J 8		08-3eb-q1 1J:12	1
1JC1q-Endrin AldehQde	IS	Z2g	Z 177		08-3eb-q1 1J:12	1
1JC1q-Endrin ' etone	IS	( 2g	Z 177		08-3eb-q1 1J:12	1



Client Data		Laboratory Data			
Name:	CDIM Engineering	Lab Sample:	2101197-01	Date Received:	26-Jan-21 11:45
Project:	LRTC Industrial Stormwater	QC Batch:	B1A0186	Date Extracted:	29-Jan-21
Matrix:	Water	Sample Size:	0.987 L	Column:	ZB-50
Date Collected:	22-Jan-21 16:41				

Analyte	Conc. (pg/L)	MDL	RL	Qualifiers	Analyzed	Dilution
Hexachlorobenzene	2080	33.5	40.5	B	10-Feb-21 04:31	1
alpha-BHC	64.6	12.6	40.5		10-Feb-21 04:31	1
Lindane (gamma-BHC)	72.6	11.8	40.5		10-Feb-21 04:31	1
beta-BHC	49.9	14.1	40.5		10-Feb-21 04:31	1
delta-BHC	ND	12.8	40.5		10-Feb-21 04:31	1
Heptachlor	ND	8.19	40.5		10-Feb-21 04:31	1
Aldrin	7.63	12.4	40.5	J	10-Feb-21 04:31	1
Oxychlordane	ND	12.4	40.5		10-Feb-21 04:31	1
cis-Heptachlor Epoxide	ND	9.10	40.5		10-Feb-21 04:31	1
trans-Heptachlor Epoxide	210	20.1	40.5		10-Feb-21 04:31	1
trans-Chlordane (gamma)	432	12.2	40.5		10-Feb-21 04:31	1
trans-Nonachlor	228	19.9	40.5		10-Feb-21 04:31	1
cis-Chlordane (alpha)	351	19.2	40.5		10-Feb-21 04:31	1
Endosulfan I (alpha)	ND	189	203		10-Feb-21 04:31	1
2,4'-DDE	457	9.20	40.5		10-Feb-21 04:31	1
4,4'-DDE	4020	11.5	40.5		10-Feb-21 04:31	1
Dieldrin	1270	10.0	40.5		10-Feb-21 04:31	1
Endrin	387	14.2	40.5		10-Feb-21 04:31	1
cis-Nonachlor	ND	11.8	40.5		10-Feb-21 04:31	1
Endosulfan II (beta)	ND	176	203		10-Feb-21 04:31	1
2,4'-DDD	2170	13.0	40.5		10-Feb-21 04:31	1
2,4'-DDT	3030	17.6	40.5		10-Feb-21 04:31	1
4,4'-DDD	2840	17.8	40.5		10-Feb-21 04:31	1
4,4'-DDT	9260	18.4	40.5		10-Feb-21 04:31	1
Endosulfan Sulfate	ND	158	203		10-Feb-21 04:31	1
4,4'-Methoxychlor	ND	173	203		10-Feb-21 04:31	1
Mirex	ND	12.8	40.5		10-Feb-21 04:31	1
Endrin Aldehyde	ND	148	203		10-Feb-21 04:31	1
Endrin Ketone	ND	149	203		10-Feb-21 04:31	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C6-Hexachlorobenzene	IS	87.5	5 - 120		10-Feb-21 04:31	1
13C6-alpha-BHC	IS	71.8	32 - 130		10-Feb-21 04:31	1
13C6-Lindane (gamma-BHC)	IS	76.2	11 - 120		10-Feb-21 04:31	1
13C6-beta-BHC	IS	47.3	32 - 130		10-Feb-21 04:31	1
13C6-delta-BHC	IS	52.8	36 - 137		10-Feb-21 04:31	1
13C10-Heptachlor	IS	99.9	5 - 120		10-Feb-21 04:31	1
13C12-Aldrin	IS	65.7	5 - 120		10-Feb-21 04:31	1
13C10-Oxychlordane	IS	65.1	23 - 135		10-Feb-21 04:31	1
13C10-cis-Heptachlor Epoxide	IS	49.5	27 - 137		10-Feb-21 04:31	1
13C10-trans-Chlordane (gamma)	IS	32.2	21 - 132		10-Feb-21 04:31	1
13C10-trans-Nonachlor	IS	39.5	14 - 136		10-Feb-21 04:31	1
13C9-Endosulfan I (alpha)	IS	50.9	15 - 148		10-Feb-21 04:31	1
13C12-2,4'-DDE	IS	49.9	47 - 160		10-Feb-21 04:31	1
13C12-4,4'-DDE	IS	38.6	47 - 160	H	10-Feb-21 04:31	1
13C12-Dieldrin	IS	42.9	40 - 151		10-Feb-21 04:31	1
13C12-Endrin	IS	38.4	35 - 155		10-Feb-21 04:31	1
13C10-cis-Nonachlor	IS	25.1	36 - 139	H	10-Feb-21 04:31	1
13C9-Endosulfan II (beta)	IS	27.9	5 - 122		10-Feb-21 04:31	1
13C12-2,4'-DDD	IS	39.8	5 - 199		10-Feb-21 04:31	1
13C12-2,4'-DDT	IS	39.9	5 - 199		10-Feb-21 04:31	1
13C12-4,4'-DDD	IS	26.5	5 - 120		10-Feb-21 04:31	1

<b>Client Data</b>		<b>Laboratory Data</b>			
Name:	CDIM Engineering	Lab Sample:	2101197-01	Date Received:	26-Jan-21 11:45
Project:	LRTC Industrial Stormwater	QC Batch:	B1A0186	Date Extracted:	29-Jan-21
Matrix:	Water	Sample Size:	0.987 L	Column:	ZB-50
Date Collected:	22-Jan-21 16:41				

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C12-4,4'-DDT	IS	20.8	5 - 120		10-Feb-21 04:31	1
13C9-Endosulfan Sulfate	IS	16.5	15 - 148		10-Feb-21 04:31	1
13C12-Methoxychlor	IS	19.7	5 - 120		10-Feb-21 04:31	1
13C10-Mirex	IS	30.0	5 - 120		10-Feb-21 04:31	1
13C12-Endrin Aldehyde	IS	14.6	15 - 148	H	10-Feb-21 04:31	1
13C12-Endrin Ketone	IS	12.2	15 - 148	H	10-Feb-21 04:31	1

MDL - Method Detection Limit  
RL - Reporting limit

## DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
CRS	Cleanup Recovery Standard
D	Dilution
DL	Detection Limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
IS	Internal Standard
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limit of Detection
LOQ	Limit of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
MDL	Method Detection Limit
NA	Not applicable
ND	Not Detected
OPR	Ongoing Precision and Recovery sample
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
RL	Reporting Limit
RL	For 537.1, the reported RLs are the MRLs.
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)
*	See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

### Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-23
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Massachusetts Department of Environmental Protection	N/A
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718-B
New Jersey Department of Environmental Protection	190001
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	016
Texas Commission on Environmental Quality	T104704189-19-10
Vermont Department of Health	VT-4042
Virginia Department of General Services	10272
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

## NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	Method
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	Method
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	Method
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A





## Sample Log-In Checklist

 Page # 1 of 1

 Vista Work Order #: 2101197

 TAT std

<b>Samples Arrival:</b>	<b>Date/Time</b> 01/26/21 1145	<b>Initials:</b> WJS	<b>Location:</b> WR-2
			<b>Shelf/Rack:</b> N/A
<b>Delivered By:</b>	<input checked="" type="radio"/> FedEx	<input type="radio"/> UPS	<input type="radio"/> On Trac
		<input type="radio"/> GLS	<input type="radio"/> DHL
		<input type="radio"/> Hand Delivered	<input type="radio"/> Other
<b>Preservation:</b>	<input checked="" type="radio"/> Ice	<input checked="" type="radio"/> Blue Ice	<input type="radio"/> Techni Ice
		<input type="radio"/> Dry Ice	<input type="radio"/> None
<b>Temp °C:</b> 1.2 (uncorrected)	<b>Probe used:</b> Y / <input checked="" type="radio"/> N		<b>Thermometer ID:</b> IR-4
<b>Temp °C:</b> 1.2 (corrected)			

	YES	NO	NA
Shipping Container(s) Intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shipping Custody Seals Intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Airbill <u>—</u> Trk # <u>7829 8407 5943</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shipping Documentation Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shipping Container	Vista	<input checked="" type="radio"/> Client	Retain
		<input checked="" type="radio"/> Return	Dispose
Chain of Custody / Sample Documentation Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chain of Custody / Sample Documentation Complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Holding Time Acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<b>Logged In:</b>	<b>Date/Time</b> 01/27/21 0821	<b>Initials:</b> KS	<b>Location:</b> WR-2
			<b>Shelf/Rack:</b> B-3
COC Anomaly/Sample Acceptance Form completed?			<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>

Comments:

# CoC/Label Reconciliation Report WO# 2101197

LabNumber	CoC Sample ID	Sample Alias	Sample Date/Time	Container	BaseMatrix	Sample Comments
2101197-01	A TS2-I-210122		22-Jan-21 16:41	Amber Glass NM Bottle, 1L	Aqueous	
2101197-01	B TS2-I-210122		22-Jan-21 16:41	Amber Glass NM Bottle, 1L	Aqueous	
2101197-01	C TS2-I-210122		22-Jan-21 16:41	Amber Glass NM Bottle, 1L	Aqueous	

Checkmarks indicate that information on the COC reconciled with the sample label.  
Any discrepancies are noted in the following columns.

	Yes	No	NA	Comments:
Sample Container Intact?	<input checked="" type="checkbox"/>			
Sample Custody Seals Intact?			<input checked="" type="checkbox"/>	
Adequate Sample Volume?	<input checked="" type="checkbox"/>			
Container Type Appropriate for Analysis(es)	<input checked="" type="checkbox"/>			
Preservation Documented: Na2S2O3    Trizma <del>None</del> Other		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			<input checked="" type="checkbox"/>	

Verified by/Date: 162 01/27/21



## LEVEL 2 DATA REVIEW SUMMARY

**Project Name:** LRTC 2020-2021 Storm Water

**Project Number:** 101-006-LRTC, Task 1

**Analyses:** EPA 1699

**Lab Order Number:** 2101197

**Sample Dates:** 8/4/2021

Laboratory QC Criteria	Yes	No	NA
Have all samples been extracted/analyzed within holding times?	X		
Are detection and reporting limits acceptable?	X		
Are all surrogate recoveries in all samples within QC limits?	X		
Are all LCS (BS) recoveries within QC limits?	X		
Are all MS/MSD recoveries and RPDs within QC limits?			X
Are method blanks free of contamination?		X <sup>2</sup>	
Are travel blanks free of contamination?			X
Are field/equipment blanks free of contamination?			X
Are all compounds present in either the sample or duplicate also present in the other?			X
Are all RPDs between sample and duplicate acceptable?			X

### Flags:

Sample ID	Compound	Det Flag	Lab Quals	Val Quals	Final Quals	Reportable Result?
TS2-I-210122	Hexachloro-benzene	--	B	--	B	Yes
	4,4'-DDE	--	--	--	H	Yes <sup>1</sup>
	cis-Nonachlor	--	--	--	H	Yes <sup>1</sup>
	Endrin Aldehyde	--	--	--	H	Yes <sup>1</sup>
	Endrin Keytone	--	--	--	H	Yes <sup>1</sup>

B = the compound was also detected in the method blank

J = identification of the analyte is acceptable; reported value is an estimate (result is between laboratory detection and reporting limits)

### Comments:

1. Recovery for the following labeled standards were below the acceptable method limit: 13C12-4,4-DDE, 13C10-cis-Nonachlor, 13C12-Endrin Aldehyde and 13C12-Endrin Ketone. All

NOTE: Laboratory invoices should not be approved for payment until this review has been completed and all issues resolved.



associated samples with detected results must be noted in any data transmittal (i.e., data tables).

2. Hexachlorobenzene was detected in the method blank at a concentration of 45.4 (J) pg/L. Sample result for hexachlorobenzene was B-flagged by the lab.
3. Results detected between detection limit and reporting limit (denoted "J") without other data flags omitted for brevity.

Reviewed by:

A handwritten signature in black ink, appearing to be "J. S. K.", written over a horizontal line.

Date: 8/4/2021

## CDIM Engineering - San Francisco, CA

Sample Delivery Group: L1310196  
Samples Received: 01/26/2021  
Project Number:  
Description: LRTC Industrial Stormwater  
  
Report To: Bryan Starks  
45 Polk Street  
3rd Floor  
San Francisco, CA 94102

Entire Report Reviewed By:



Jennifer Gambill  
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

**Pace Analytical National**

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 [www.pacenational.com](http://www.pacenational.com)



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# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



## TS1-I-210122 L1310196-01 WW

Collected by  
BS/JR

Collected date/time  
01/22/21 16:14

Received date/time  
01/26/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1612444	1	01/27/21 15:44	01/27/21 17:16	MMF	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1613358	1	01/29/21 09:30	01/29/21 18:23	ERK	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1614159	1	01/31/21 14:39	01/31/21 14:39	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1611942	1	01/29/21 14:39	01/30/21 19:42	LD	Mt. Juliet, TN

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

## TS2-I-210122 L1310196-02 WW

Collected by  
BS/JR

Collected date/time  
01/22/21 16:41

Received date/time  
01/26/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1612444	1	01/27/21 15:44	01/27/21 17:16	MMF	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1613358	1	01/29/21 09:30	01/29/21 18:23	ERK	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1614159	1	01/31/21 14:39	01/31/21 14:39	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1611942	1	01/29/21 14:39	01/30/21 19:46	LD	Mt. Juliet, TN

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

## TS3-I-210122 L1310196-03 WW

Collected by  
BS/JR

Collected date/time  
01/22/21 17:12

Received date/time  
01/26/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1612444	1	01/27/21 15:44	01/27/21 17:16	MMF	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1613358	1	01/29/21 09:30	01/29/21 18:23	ERK	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1614159	1	01/31/21 14:39	01/31/21 14:39	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1611942	1	01/29/21 14:39	01/30/21 19:50	LD	Mt. Juliet, TN

<sup>9</sup> Sc

## TS4-I-210122 L1310196-04 WW

Collected by  
BS/JR

Collected date/time  
01/22/21 17:25

Received date/time  
01/26/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1612444	1	01/27/21 15:44	01/27/21 17:16	MMF	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1613358	1	01/29/21 09:30	01/29/21 18:23	ERK	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1614159	1	01/31/21 14:39	01/31/21 14:39	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1611942	1	01/29/21 14:39	01/30/21 19:53	LD	Mt. Juliet, TN

ACCOUNT:

CDIM Engineering - San Francisco, CA

PROJECT:

SDG:

L1310196

DATE/TIME:

02/02/21 10:41

PAGE:

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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jennifer Gambill  
Project Manager

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	592		7.00	50.0	1	01/27/2021 17:16	<a href="#">WG1612444</a>

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	4.63	J	1.22	5.26	1	01/29/2021 18:23	<a href="#">WG1613358</a>

## Sample Narrative:

L1310196-01 WG1613358: Achieving a constant weight is not possible due to sample matrix

## Wet Chemistry by Method 4500H+ B-2011

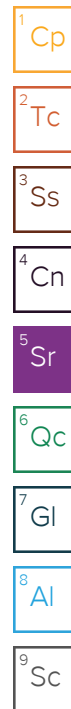
Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.65	T8	1	01/31/2021 14:39	<a href="#">WG1614159</a>

## Sample Narrative:

L1310196-01 WG1614159: 7.65 at 19.2C

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	2.89		0.0470	0.100	1	01/30/2021 19:42	<a href="#">WG1611942</a>
Iron	10.3		0.0447	0.100	1	01/30/2021 19:42	<a href="#">WG1611942</a>
Lead	0.0907		0.000513	0.00200	1	01/30/2021 19:42	<a href="#">WG1611942</a>
Zinc	0.716		0.00796	0.0200	1	01/30/2021 19:42	<a href="#">WG1611942</a>





## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	124		2.00	14.3	1	01/27/2021 17:16	<a href="#">WG1612444</a>

1 Cp

2 Tc

3 Ss

4 Cn

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	2.60	J	1.16	5.00	1	01/29/2021 18:23	<a href="#">WG1613358</a>

5 Sr

## Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.56	T8	1	01/31/2021 14:39	<a href="#">WG1614159</a>

6 Qc

7 Gl

## Sample Narrative:

L1310196-02 WG1614159: 7.56 at 19C

8 Al

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	0.495		0.0470	0.100	1	01/30/2021 19:46	<a href="#">WG1611942</a>
Iron	1.62		0.0447	0.100	1	01/30/2021 19:46	<a href="#">WG1611942</a>
Lead	0.00963		0.000513	0.00200	1	01/30/2021 19:46	<a href="#">WG1611942</a>
Zinc	0.157		0.00796	0.0200	1	01/30/2021 19:46	<a href="#">WG1611942</a>

9 Sc



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	44.4		1.40	10.0	1	01/27/2021 17:16	<a href="#">WG1612444</a>

1 Cp

2 Tc

3 Ss

4 Cn

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	U		1.29	5.56	1	01/29/2021 18:23	<a href="#">WG1613358</a>

5 Sr

6 Qc

## Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.13	<a href="#">T8</a>	1	01/31/2021 14:39	<a href="#">WG1614159</a>

7 Gl

8 Al

## Sample Narrative:

L1310196-03 WG1614159: 7.13 at 19.3C

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	1.35		0.0470	0.100	1	01/30/2021 19:50	<a href="#">WG1611942</a>
Iron	3.01		0.0447	0.100	1	01/30/2021 19:50	<a href="#">WG1611942</a>
Lead	0.0357		0.000513	0.00200	1	01/30/2021 19:50	<a href="#">WG1611942</a>
Zinc	0.192		0.00796	0.0200	1	01/30/2021 19:50	<a href="#">WG1611942</a>

9 Sc



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	1720		7.00	50.0	1	01/27/2021 17:16	<a href="#">WG1612444</a>

1 Cp

2 Tc

3 Ss

4 Cn

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	4.00	J	1.29	5.56	1	01/29/2021 18:23	<a href="#">WG1613358</a>

5 Sr

6 Qc

## Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.42	T8	1	01/31/2021 14:39	<a href="#">WG1614159</a>

7 Gl

8 Al

## Sample Narrative:

L1310196-04 WG1614159: 7.42 at 19C

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	13.6		0.0470	0.100	1	01/30/2021 19:53	<a href="#">WG1611942</a>
Iron	40.8		0.0447	0.100	1	01/30/2021 19:53	<a href="#">WG1611942</a>
Lead	0.735		0.000513	0.00200	1	01/30/2021 19:53	<a href="#">WG1611942</a>
Zinc	2.76		0.00796	0.0200	1	01/30/2021 19:53	<a href="#">WG1611942</a>

9 Sc

Method Blank (MB)

(MB) R3617115-1 01/27/21 17:16

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Suspended Solids	U		0.350	2.50

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

L1309830-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1309830-01 01/27/21 17:16 • (DUP) R3617115-3 01/27/21 17:16

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Suspended Solids	262	245	1	6.58	J3	5

L1310196-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1310196-01 01/27/21 17:16 • (DUP) R3617115-4 01/27/21 17:16

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Suspended Solids	592	600	1	1.34		5

Laboratory Control Sample (LCS)

(LCS) R3617115-2 01/27/21 17:16

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Suspended Solids	773	728	94.2	85.7-114	



Method Blank (MB)

(MB) R3617632-1 01/29/21 18:23

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Oil & Grease (Hexane Extr)	U		1.16	5.00

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3617632-2 01/29/21 18:23 • (LCSD) R3617632-3 01/29/21 18:23

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Oil & Grease (Hexane Extr)	40.0	41.1	33.7	103	84.3	78.0-114			19.8	20

L1310207-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1310207-05 01/29/21 18:23 • (MS) R3617632-4 01/29/21 18:23 • (MSD) R3617632-5 01/29/21 18:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Oil & Grease (Hexane Extr)	40.0	U	25.6	32.3	63.9	80.8	1	78.0-114	J6	J3	23.4	18



L1310196-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1310196-01 01/31/21 14:39 • (DUP) R3617933-2 01/31/21 14:39

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.65	7.63	1	0.262		1

Sample Narrative:  
OS: 7.65 at 19.2C  
DUP: 7.63 at 19.1C

L1310235-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1310235-06 01/31/21 14:39 • (DUP) R3617933-3 01/31/21 14:39

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.68	7.65	1	0.391		1

Sample Narrative:  
OS: 7.68 at 20.7C  
DUP: 7.65 at 19.1C

Laboratory Control Sample (LCS)

(LCS) R3617933-1 01/31/21 14:39

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	10.1	101	99.0-101	

Sample Narrative:  
LCS: 10.05 at 19.3C

1Cp

2Tc

3Ss

4Cn

5Sr

6Qc

7Gl

8Al

9Sc



Method Blank (MB)

(MB) R3617936-1 01/30/21 18:21

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum	U		0.0470	0.100
Iron	U		0.0447	0.100
Lead	U		0.000513	0.00200
Zinc	U		0.00796	0.0200

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Laboratory Control Sample (LCS)

(LCS) R3617936-2 01/30/21 18:24

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum	5.00	4.86	97.2	85.0-115	
Iron	5.00	5.04	101	85.0-115	
Lead	0.0500	0.0500	99.9	85.0-115	
Zinc	0.500	0.493	98.7	85.0-115	

L1309987-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1309987-01 01/30/21 18:28 • (MS) R3617936-4 01/30/21 18:35 • (MSD) R3617936-5 01/30/21 18:38

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	5.00	0.245	5.13	5.14	97.8	97.9	1	70.0-130			0.180	20
Iron	5.00	0.147	5.19	5.09	101	98.8	1	70.0-130			2.03	20
Lead	0.0500	0.00191	0.0496	0.0495	95.4	95.1	1	70.0-130			0.337	20
Zinc	0.500	0.139	0.568	0.568	85.8	85.9	1	70.0-130			0.0870	20

L1310207-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1310207-05 01/30/21 18:42 • (MS) R3617936-6 01/30/21 18:46 • (MSD) R3617936-7 01/30/21 18:49

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	5.00	0.0657	4.86	4.81	95.8	94.9	1	70.0-130			0.964	20
Iron	5.00	0.112	5.24	4.91	103	96.0	1	70.0-130			6.55	20
Lead	0.0500	0.00167	0.0517	0.0512	100	99.0	1	70.0-130			1.01	20
Zinc	0.500	0.0450	0.552	0.524	101	95.7	1	70.0-130			5.20	20



## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

## Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

## Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

\* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

\* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

### Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN, 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico <sup>1</sup>	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina <sup>1</sup>	DW21704
Georgia	NELAP	North Carolina <sup>3</sup>	41
Georgia <sup>1</sup>	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky <sup>1 6</sup>	KY90010	South Carolina	84004002
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1 4</sup>	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

### Pace Analytical National 1313 Point Mallard Parkway SE Suite B Decatur, AL, 35601

Alabama	40160
ANSI National Accreditation Board	L2239

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California	2961	Oregon	CA300002
Minnesota	006-999-465	Washington	C926
North Dakota	R-214		

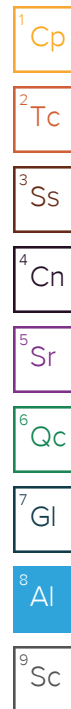
### Pace Analytical National 6000 South Eastern Avenue Ste 9A Las Vegas, NV, 89119

Nevada	NV009412021-1
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### Pace Analytical National 1606 E. Brazos Street Suite D Victoria, TX, 77901

Texas	T104704328-20-18
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<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>6</sup> Wastewater n/a Accreditation not applicable





## CHAIN OF CUSTODY RECORD

L1310196

LABORATORY:				INSTRUCTIONS FOR LAB PERSONNEL:				Analysis Turnaround Time				COC Number:			
ES&C Laboratory 12065 Lebanon Road, Mt. Juliet, TN 37122 (615) 773-9670 Jennifer Gambill jgambill@esandc.com				Please send analytic results, electronic deliverables and the original Chain-of-Custody form to: jgambill@esandc.com, jgambill@esandc.com				GeoTracker EDF required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No LOCUS EDO required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Report Results to: <input type="checkbox"/> RL <input checked="" type="checkbox"/> X MDL Report soil results to: <input type="checkbox"/> wet weight (total) <input type="checkbox"/> dry weight				Specify analytic/prep method and detection limit in report. Notify us of any anomalous peaks in GC or other scans. Call immediately with any questions or problems.			
CDM CONTACT: CDM Engineering 45 Park Street, 3rd Floor San Francisco, California 94102				Project Manager: Bryan Starks Phone Number: 415-498-0535 Sampled by: BS/SR Sample date(s): 1/22/21				ANALYSIS REQUESTED							
PROJECT INFORMATION															
Job Name: LRTC Industrial Stormwater															
Job #:															
Address: 402 Wright Avenue, Richmond CA 94804															
Lab ID	Sample Identification	Sample Date	Sample Time	Sample Matrix	# of Cont.	pH (SM 4500HB)	Total Suspended Solids (SM 2540D)	Oil & Grease (EPA 1664A SGT-HEM)	Total Metals- Al, Fe, Pb, Zn (EPA 200.8 ICP-MS)					Sample Specific Notes:	
TS1-1-210122	01-22-21	1604	W	Y	Y	X	X	X	X					701	
TS2-1-210122	01-22-21	1641	W	Y	Y	X	X	X	X					103	
TS3-1-210122	01-22-21	1712	W	Y	Y	X	X	X	X					104	
TS4-1-210122	01-22-21	1735	W	Y	Y	X	X	X	X						
Field Filtered (X):						1	1	1, 3	1, 4						
Preservation Used: 1= Ice, 2= HCl; 3= H <sub>2</sub> SO <sub>4</sub> ; 4=HNO <sub>3</sub> ; 5=NaOH; 6= Other															
Special Instructions/AG Requirements & Comments: Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.															
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:	0.3-1-21.2 AZ									
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:										
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:										
x = Samples released to a secured, locked area.															
SAMPLERS NAME						MOBILE #						DATE / TIME			
SAMPLERS SIGNATURE						DATE / TIME									

J052

FedEx 7829 83718385 0147/8133

Sample Receipt Checklist

COC Seal Present/Intact: ☒ N

COC Signed/Accurate: ☒ N

Bottles active/Intact: ☒ N

Correct bottles used: ☒ N

Sufficient volume sent: ☒ N

PAD Screen <0.5 mR/hr: ☒ N

If Applicable

VQA Zero Headspace: ☒ N

Pres./Correct/Check: ☒ N



## LEVEL 2 DATA REVIEW SUMMARY

**Project Name:** LRTC 2020-2021 Storm Water

**Project Number:** 101-006-LRTC, Task 1

**Analyses:** EPA 200.8, 1664A, SM 4500H+B; SM2540D

**Lab Order Number:** L1310196

**Sample Dates:** 01/22/21

Laboratory QC Criteria	Yes	No	NA
Have all samples been extracted/analyzed within holding times?		X <sup>1</sup>	
Are detection and reporting limits acceptable?	X		
Are all surrogate recoveries in all samples within QC limits?			X
Are all LCS (BS) recoveries within QC limits?	X		
Are all MS/MSD recoveries and RPDs within QC limits?		X <sup>2</sup>	
Are method blanks free of contamination?	X		
Are travel blanks free of contamination?			X
Are field/equipment blanks free of contamination?			X
Are all compounds present in either the sample or duplicate also present in the other?	X		
Are all RPDs between sample and duplicate acceptable?	X		

### Flags:

Sample ID	Compound	Det Flag	Lab Quals	Val Quals	Final Quals	Reportable Result?
TS1-I-210122 TS2-I-210122 TS3-I-210122 TS4-I-210122	pH	--	T8	--	none	Yes
TS1-I-210122 TS2-I-210122 TS4-I-210122	Oil and Grease	J	--	--	J	Yes

J = identification of the analyte is acceptable; reported value is an estimate (result is between laboratory detection and reporting limits)

T8 = samples received past/too close to holding time expiration

### Comments:

1. pH not analyzed within 15 minutes of sampling, however analyzed upon receipt by laboratory.
2. MS, MSD, and/or MS/MSD RPD for oil and grease are outside of acceptable laboratory quality control range. However, original spiked sample not from this project and therefore no flags are needed.

NOTE: Laboratory invoices should not be approved for payment until this review has been completed and all issues resolved.



Reviewed by: 

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Date: 2/4/21

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February 18, 2021

**Vista Work Order No. 2101196**

Mr. Bryan Starks  
CDIM Engineering  
45 Polk Street, 3rd Floor  
San Francisco, CA 94102

Dear Mr. Starks,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on January 26, 2021 under your Project Name 'LRTC Industrial Stormwater'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at [mmaier@vista-analytical.com](mailto:mmaier@vista-analytical.com).

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

A handwritten signature in black ink, appearing to read "Martha Maier", followed by the word "for" in a standard font.

Martha Maier  
Laboratory Director



*Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.*

## Vista Work Order No. 2101196

### Case Narrative

#### Sample Condition on Receipt:

One water sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology. The sample was received in good condition and within the method temperature requirements.

#### Analytical Notes:

##### EPA Method 1699

The three bottles of the sample were composited prior to an aliquot taken for extraction and analyzed for chlorinated pesticides by EPA Method 1699 using a ZB-50 GC column.

##### Holding Times

The sample was extracted and analyzed within the method hold times.

##### Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected above the sample quantitation limits in the Method Blank. The OPR recoveries were within the method acceptance criteria.

The labeled standard recovery outside the method acceptance criteria is listed in the table below:

##### QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
2101196-01	TS2-E-210122	EPA Method 1699	13C12-Methoxychlor	H	137

H = Recovery was outside laboratory acceptance criteria.

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# Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2101196-01	TS2-E-210122	22-Jan-21 16:50	26-Jan-21 11:45	Amber Glass NM Bottle, 1L Amber Glass NM Bottle, 1L Amber Glass NM Bottle, 1L

## **ANALYTICAL RESULTS**

Sample ID: Method Blank				EPA Method 1699		
<b>Client Data</b> Name: CDIM Engineering Project: LRTC Industrial Stormwater Matrix: Aqueous		<b>Laboratory Data</b> Lab Sample: B1A0186-BLK1 QC Batch: B1A0186      Date Extracted: 29-Jan-21 Sample Size: 1.00 L      Column: ZB-50				
Analyte	Conc. (pg/L)	MDL	RL	Qualifiers	Analyzed	Dilution
Hexachlorobenzene	4.45	33.1	40.0	J	08-Feb-21 14:56	1
alpha-BHC	ND	12.4	40.0		08-Feb-21 14:56	1
Lindane (gamma-BHC)	ND	11.6	40.0		08-Feb-21 14:56	1
beta-BHC	ND	13.9	40.0		08-Feb-21 14:56	1
delta-BHC	ND	12.6	40.0		08-Feb-21 14:56	1
Heptachlor	ND	8.08	40.0		08-Feb-21 14:56	1
Aldrin	ND	12.2	40.0		08-Feb-21 14:56	1
Oxychlordane	ND	12.2	40.0		08-Feb-21 14:56	1
cis-Heptachlor Epoxide	ND	8.98	40.0		08-Feb-21 14:56	1
trans-Heptachlor Epoxide	ND	19.8	40.0		08-Feb-21 14:56	1
trans-Chlordane (gamma)	ND	12.0	40.0		08-Feb-21 14:56	1
trans-Nonachlor	ND	19.6	40.0		08-Feb-21 14:56	1
cis-Chlordane (alpha)	ND	19.0	40.0		08-Feb-21 14:56	1
Endosulfan I (alpha)	ND	187	200		08-Feb-21 14:56	1
2,4'-DDE	ND	9.08	40.0		08-Feb-21 14:56	1
4,4'-DDE	ND	11.4	40.0		08-Feb-21 14:56	1
Dieldrin	ND	9.89	40.0		08-Feb-21 14:56	1
Endrin	ND	14.0	40.0		08-Feb-21 14:56	1
cis-Nonachlor	ND	11.6	40.0		08-Feb-21 14:56	1
Endosulfan II (beta)	ND	174	200		08-Feb-21 14:56	1
2,4'-DDD	ND	12.8	40.0		08-Feb-21 14:56	1
2,4'-DDT	ND	17.4	40.0		08-Feb-21 14:56	1
4,4'-DDD	ND	17.6	40.0		08-Feb-21 14:56	1
4,4'-DDT	ND	18.2	40.0		08-Feb-21 14:56	1
Endosulfan Sulfate	ND	156	200		08-Feb-21 14:56	1
4,4'-Methoxychlor	ND	171	200		08-Feb-21 14:56	1
Mirex	ND	12.6	40.0		08-Feb-21 14:56	1
Endrin Aldehyde	ND	146	200		08-Feb-21 14:56	1
Endrin Ketone	ND	147	200		08-Feb-21 14:56	1
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C6-Hexachlorobenzene	IS	78.5	5 - 120		08-Feb-21 14:56	1
13C6-alpha-BHC	IS	87.3	32 - 130		08-Feb-21 14:56	1
13C6-Lindane (gamma-BHC)	IS	86.0	11 - 120		08-Feb-21 14:56	1
13C6-beta-BHC	IS	80.5	32 - 130		08-Feb-21 14:56	1
13C6-delta-BHC	IS	84.4	36 - 137		08-Feb-21 14:56	1
13C10-Heptachlor	IS	80.9	5 - 120		08-Feb-21 14:56	1
13C12-Aldrin	IS	92.2	5 - 120		08-Feb-21 14:56	1
13C10-Oxychlordane	IS	101	23 - 135		08-Feb-21 14:56	1
13C10-cis-Heptachlor Epoxide	IS	105	27 - 137		08-Feb-21 14:56	1
13C10-trans-Chlordane (gamma)	IS	92.7	21 - 132		08-Feb-21 14:56	1
13C10-trans-Nonachlor	IS	88.9	14 - 136		08-Feb-21 14:56	1
13C9-Endosulfan I (alpha)	IS	111	15 - 148		08-Feb-21 14:56	1
13C12-2,4'-DDE	IS	111	47 - 160		08-Feb-21 14:56	1
13C12-4,4'-DDE	IS	105	47 - 160		08-Feb-21 14:56	1
13C12-Dieldrin	IS	94.8	40 - 151		08-Feb-21 14:56	1
13C12-Endrin	IS	80.4	35 - 155		08-Feb-21 14:56	1
13C10-cis-Nonachlor	IS	80.9	36 - 139		08-Feb-21 14:56	1
13C9-Endosulfan II (beta)	IS	90.7	5 - 122		08-Feb-21 14:56	1
13C12-2,4'-DDD	IS	94.4	5 - 199		08-Feb-21 14:56	1
13C12-2,4'-DDT	IS	88.3	5 - 199		08-Feb-21 14:56	1
13C12-4,4'-DDD	IS	87.8	5 - 120		08-Feb-21 14:56	1

<b>Client Data</b>		<b>Laboratory Data</b>			
Name:	CDIM Engineering	Lab Sample:	B1A0186-BLK1		
Project:	LRTC Industrial Stormwater	QC Batch:	B1A0186	Date Extracted:	29-Jan-21
Matrix:	Aqueous	Sample Size:	1.00 L	Column:	ZB-50

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C12-4,4'-DDT	IS	94.2	5 - 120		08-Feb-21 14:56	1
13C9-Endosulfan Sulfate	IS	92.8	15 - 148		08-Feb-21 14:56	1
13C12-Methoxychlor	IS	91.5	5 - 120		08-Feb-21 14:56	1
13C10-Mirex	IS	83.0	5 - 120		08-Feb-21 14:56	1
13C12-Endrin Aldehyde	IS	60.3	15 - 148		08-Feb-21 14:56	1
13C12-Endrin Ketone	IS	74.4	15 - 148		08-Feb-21 14:56	1

MDL - Method Detection Limit  
RL - Reporting limit



Sample ID: OPR				EPA Method 1699			
<b>Client Data</b> Name: CDIM Engineering Project: LRTC Industrial Stormwater Matrix: Aqueous			<b>Laboratory Data</b> Lab Sample: B1A0186-BS1 QC Batch: B1A0186 Sample Size: 1.00 L Date Extracted: 29-Jan-21 05:35 Column: ZB-50				
Analyte	Amt Found (pg/L)	Spike Amt	% Recovery	Limits	Qualifiers	Analyzed	Dilution
Hexachlorobenzene	1020	1000	102	50-120	B	08-Feb-21 13:19	1
alpha-BHC	1010	1000	101	50-120		08-Feb-21 13:19	1
Lindane (gamma-BHC)	1000	1000	100	50-120		08-Feb-21 13:19	1
beta-BHC	991	1000	99.1	50-120		08-Feb-21 13:19	1
delta-BHC	1020	1000	102	50-120		08-Feb-21 13:19	1
Heptachlor	967	1000	96.7	50-120		08-Feb-21 13:19	1
Aldrin	962	1000	96.2	50-120		08-Feb-21 13:19	1
Oxychlordane	959	1000	95.9	50-120		08-Feb-21 13:19	1
cis-Heptachlor Epoxide	982	1000	98.2	50-120		08-Feb-21 13:19	1
trans-Heptachlor Epoxide	1010	1000	101	50-120		08-Feb-21 13:19	1
trans-Chlordane (gamma)	998	1000	99.8	50-120		08-Feb-21 13:19	1
trans-Nonachlor	953	1000	95.3	50-120		08-Feb-21 13:19	1
cis-Chlordane (alpha)	1060	1000	106	50-120		08-Feb-21 13:19	1
Endosulfan I (alpha)	919	1000	91.9	50-120		08-Feb-21 13:19	1
2,4'-DDE	958	1000	95.8	24-123		08-Feb-21 13:19	1
4,4'-DDE	960	1000	96.0	50-120		08-Feb-21 13:19	1
Dieldrin	1010	1000	101	50-120		08-Feb-21 13:19	1
Endrin	1020	1000	102	50-120		08-Feb-21 13:19	1
cis-Nonachlor	1060	1000	106	50-120		08-Feb-21 13:19	1
Endosulfan II (beta)	1030	1000	103	5-200		08-Feb-21 13:19	1
2,4'-DDD	1030	1000	103	50-120		08-Feb-21 13:19	1
2,4'-DDT	1110	1000	111	50-120		08-Feb-21 13:19	1
4,4'-DDD	1050	1000	105	42-120		08-Feb-21 13:19	1
4,4'-DDT	966	1000	96.6	50-120		08-Feb-21 13:19	1
Endosulfan Sulfate	966	1000	96.6	50-120		08-Feb-21 13:19	1
4,4'-Methoxychlor	1000	1000	100	50-120		08-Feb-21 13:19	1
Mirex	1000	1000	100	50-120		08-Feb-21 13:19	1
Endrin Aldehyde	962	1000	96.2	50-134		08-Feb-21 13:19	1
Endrin Ketone	986	1000	98.6	50-134		08-Feb-21 13:19	1
Labeled Standards	Type		% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C6-Hexachlorobenzene	IS		70.3	5-120		08-Feb-21 13:19	1
13C6-alpha-BHC	IS		81.6	17-141		08-Feb-21 13:19	1
13C6-Lindane (gamma-BHC)	IS		82.4	5-124		08-Feb-21 13:19	1
13C6-beta-BHC	IS		80.5	17-141		08-Feb-21 13:19	1
13C6-delta-BHC	IS		84.9	16-150		08-Feb-21 13:19	1
13C10-Heptachlor	IS		78.4	5-128		08-Feb-21 13:19	1
13C12-Aldrin	IS		86.0	5-126		08-Feb-21 13:19	1
13C10-Oxychlordane	IS		107	5-144		08-Feb-21 13:19	1
13C10-cis-Heptachlor Epoxide	IS		108	8-146		08-Feb-21 13:19	1
13C10-trans-Chlordane (gamma)	IS		98.0	15-144		08-Feb-21 13:19	1
13C10-trans-Nonachlor	IS		95.2	13-149		08-Feb-21 13:19	1
13C9-Endosulfan I (alpha)	IS		118	5-144		08-Feb-21 13:19	1
13C12-2,4'-DDE	IS		107	26-169		08-Feb-21 13:19	1
13C12-4,4'-DDE	IS		102	26-169		08-Feb-21 13:19	1
13C12-Dieldrin	IS		96.6	19-161		08-Feb-21 13:19	1

Sample ID: OPR				EPA Method 1699		
<b>Client Data</b> Name: CDIM Engineering Project: LRTC Industrial Stormwater Matrix: Aqueous		<b>Laboratory Data</b> Lab Sample: B1A0186-BS1 QC Batch: B1A0186 Sample Size: 1.00 L Date Extracted: 29-Jan-21 05:35 Column: ZB-50				
Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C12-Endrin	IS	87.0	20-157		08-Feb-21 13:19	1
13C10-cis-Nonachlor	IS	85.3	17-154		08-Feb-21 13:19	1
13C9-Endosulfan II (beta)	IS	95.4	5-120		08-Feb-21 13:19	1
13C12-2,4'-DDD	IS	96.8	14-200		08-Feb-21 13:19	1
13C12-2,4'-DDT	IS	90.4	14-200		08-Feb-21 13:19	1
13C12-4,4'-DDD	IS	89.6	14-200		08-Feb-21 13:19	1
13C12-4,4'-DDT	IS	102	13-200		08-Feb-21 13:19	1
13C9-Endosulfan Sulfate	IS	92.9	5-144		08-Feb-21 13:19	1
13C12-Methoxychlor	IS	97.8	8-200		08-Feb-21 13:19	1
13C10-Mirex	IS	86.6	5-138		08-Feb-21 13:19	1
13C12-Endrin Aldehyde	IS	59.3	5-144		08-Feb-21 13:19	1
13C12-Endrin Ketone	IS	79.8	5-144		08-Feb-21 13:19	1

## Sample ID: TS2-E-210122

## EPA Method 1699

Client Data		Laboratory Data			
Name:	CDIM Engineering	Lab Sample:	2101196-01	Date Received:	26-Jan-21 11:45
Project:	LRTC Industrial Stormwater	QC Batch:	B1A0186	Date Extracted:	29-Jan-21
Matrix:	Water	Sample Size:	1.02 L	Column:	ZB-50
Date Collected:	22-Jan-21 16:50				

Analyte	Conc. (pg/L)	MDL	RL	Qualifiers	Analyzed	Dilution
Hexachlorobenzene	52.4	32.6	39.3	B	09-Feb-21 20:25	1
alpha-BHC	39.3	12.2	39.3		09-Feb-21 20:25	1
Lindane (gamma-BHC)	54.4	11.4	39.3		09-Feb-21 20:25	1
beta-BHC	50.0	13.7	39.3		09-Feb-21 20:25	1
delta-BHC	ND	12.4	39.3		09-Feb-21 20:25	1
Heptachlor	ND	7.95	39.3		09-Feb-21 20:25	1
Aldrin	ND	12.0	39.3		09-Feb-21 20:25	1
Oxychlordane	ND	12.0	39.3		09-Feb-21 20:25	1
cis-Heptachlor Epoxide	ND	8.83	39.3		09-Feb-21 20:25	1
trans-Heptachlor Epoxide	266	19.5	39.3		09-Feb-21 20:25	1
trans-Chlordane (gamma)	24.4	11.8	39.3	J	09-Feb-21 20:25	1
trans-Nonachlor	19.4	19.3	39.3	J	09-Feb-21 20:25	1
cis-Chlordane (alpha)	39.7	18.7	39.3		09-Feb-21 20:25	1
Endosulfan I (alpha)	ND	184	197		09-Feb-21 20:25	1
2,4'-DDE	10.2	8.93	39.3	J	09-Feb-21 20:25	1
4,4'-DDE	96.1	11.2	39.3		09-Feb-21 20:25	1
Dieldrin	540	9.73	39.3		09-Feb-21 20:25	1
Endrin	152	13.8	39.3		09-Feb-21 20:25	1
cis-Nonachlor	ND	11.4	39.3		09-Feb-21 20:25	1
Endosulfan II (beta)	ND	171	197		09-Feb-21 20:25	1
2,4'-DDD	65.0	12.6	39.3		09-Feb-21 20:25	1
2,4'-DDT	55.0	17.1	39.3		09-Feb-21 20:25	1
4,4'-DDD	84.1	17.3	39.3		09-Feb-21 20:25	1
4,4'-DDT	128	17.9	39.3		09-Feb-21 20:25	1
Endosulfan Sulfate	ND	153	197		09-Feb-21 20:25	1
4,4'-Methoxychlor	ND	168	197		09-Feb-21 20:25	1
Mirex	ND	12.4	39.3		09-Feb-21 20:25	1
Endrin Aldehyde	ND	144	197		09-Feb-21 20:25	1
Endrin Ketone	260	145	197		09-Feb-21 20:25	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C6-Hexachlorobenzene	IS	79.5	5 - 120		09-Feb-21 20:25	1
13C6-alpha-BHC	IS	80.9	32 - 130		09-Feb-21 20:25	1
13C6-Lindane (gamma-BHC)	IS	77.5	11 - 120		09-Feb-21 20:25	1
13C6-beta-BHC	IS	75.4	32 - 130		09-Feb-21 20:25	1
13C6-delta-BHC	IS	76.8	36 - 137		09-Feb-21 20:25	1
13C10-Heptachlor	IS	104	5 - 120		09-Feb-21 20:25	1
13C12-Aldrin	IS	83.4	5 - 120		09-Feb-21 20:25	1
13C10-Oxychlordane	IS	108	23 - 135		09-Feb-21 20:25	1
13C10-cis-Heptachlor Epoxide	IS	109	27 - 137		09-Feb-21 20:25	1
13C10-trans-Chlordane (gamma)	IS	93.2	21 - 132		09-Feb-21 20:25	1
13C10-trans-Nonachlor	IS	90.1	14 - 136		09-Feb-21 20:25	1
13C9-Endosulfan I (alpha)	IS	103	15 - 148		09-Feb-21 20:25	1
13C12-2,4'-DDE	IS	88.9	47 - 160		09-Feb-21 20:25	1
13C12-4,4'-DDE	IS	107	47 - 160		09-Feb-21 20:25	1
13C12-Dieldrin	IS	91.2	40 - 151		09-Feb-21 20:25	1
13C12-Endrin	IS	108	35 - 155		09-Feb-21 20:25	1
13C10-cis-Nonachlor	IS	82.3	36 - 139		09-Feb-21 20:25	1
13C9-Endosulfan II (beta)	IS	96.6	5 - 122		09-Feb-21 20:25	1
13C12-2,4'-DDD	IS	99.5	5 - 199		09-Feb-21 20:25	1
13C12-2,4'-DDT	IS	102	5 - 199		09-Feb-21 20:25	1
13C12-4,4'-DDD	IS	99.5	5 - 120		09-Feb-21 20:25	1

<b>Client Data</b>		<b>Laboratory Data</b>			
Name:	CDIM Engineering	Lab Sample:	2101196-01	Date Received:	26-Jan-21 11:45
Project:	LRTC Industrial Stormwater	QC Batch:	B1A0186	Date Extracted:	29-Jan-21
Matrix:	Water	Sample Size:	1.02 L	Column:	ZB-50
Date Collected:	22-Jan-21 16:50				

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Analyzed	Dilution
13C12-4,4'-DDT	IS	113	5 - 120		09-Feb-21 20:25	1
13C9-Endosulfan Sulfate	IS	103	15 - 148		09-Feb-21 20:25	1
13C12-Methoxychlor	IS	137	5 - 120	H	09-Feb-21 20:25	1
13C10-Mirex	IS	93.9	5 - 120		09-Feb-21 20:25	1
13C12-Endrin Aldehyde	IS	82.5	15 - 148		09-Feb-21 20:25	1
13C12-Endrin Ketone	IS	102	15 - 148		09-Feb-21 20:25	1

MDL - Method Detection Limit  
RL - Reporting limit

## DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
CRS	Cleanup Recovery Standard
D	Dilution
DL	Detection Limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
IS	Internal Standard
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limit of Detection
LOQ	Limit of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
MDL	Method Detection Limit
NA	Not applicable
ND	Not Detected
OPR	Ongoing Precision and Recovery sample
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
RL	Reporting Limit
RL	For 537.1, the reported RLs are the MRLs.
TEQ	Toxic Equivalency
U	Not Detected (specific projects only)
*	See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

### Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-23
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Massachusetts Department of Environmental Protection	N/A
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718-B
New Jersey Department of Environmental Protection	190001
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	016
Texas Commission on Environmental Quality	T104704189-19-10
Vermont Department of Health	VT-4042
Virginia Department of General Services	10272
Washington Department of Ecology	C584-19
Wisconsin Department of Natural Resources	998036160

*Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.*

## NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	Method
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	Method
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	Method
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A





## Sample Log-In Checklist

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 Vista Work Order #: 2101196

 TAT std

<b>Samples Arrival:</b>	<b>Date/Time</b> 01/26/21 1145	<b>Initials:</b> WJS	<b>Location:</b> WR-2
			<b>Shelf/Rack:</b> N/A
<b>Delivered By:</b>	<input checked="" type="radio"/> FedEx	<input type="radio"/> UPS	<input type="radio"/> On Trac
		<input type="radio"/> GLS	<input type="radio"/> DHL
		<input type="radio"/> Hand Delivered	<input type="radio"/> Other
<b>Preservation:</b>	<input checked="" type="radio"/> Ice	<input checked="" type="radio"/> Blue Ice	<input type="radio"/> Techni Ice
		<input type="radio"/> Dry Ice	<input type="radio"/> None
<b>Temp °C:</b> 1.2 (uncorrected)	<b>Probe used:</b> Y / <input checked="" type="radio"/> N		<b>Thermometer ID:</b> IR-4
<b>Temp °C:</b> 1.2 (corrected)			

	YES	NO	NA
Shipping Container(s) Intact?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shipping Custody Seals Intact?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Airbill <u>—</u> Trk # <u>7829 8407 5943</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shipping Documentation Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shipping Container	Vista	<input checked="" type="radio"/> Client	Retain
		<input checked="" type="radio"/> Return	Dispose
Chain of Custody / Sample Documentation Present?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chain of Custody / Sample Documentation Complete?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Holding Time Acceptable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Logged In:</b>	<b>Date/Time</b> 01/27/21 0816	<b>Initials:</b> KS	<b>Location:</b> WR-2
			<b>Shelf/Rack:</b> B-3
COC Anomaly/Sample Acceptance Form completed?		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Comments:

# CoC/Label Reconciliation Report WO# 2101196

LabNumber	CoC Sample ID	Sample Alias	Sample Date/Time	Container	BaseMatrix	Sample Comments
2101196-01	A TS2-E-210122		22-Jan-21 16:50	Amber Glass NM Bottle, 1L	Aqueous	
2101196-01	B TS2-E-210122		22-Jan-21 16:50	Amber Glass NM Bottle, 1L	Aqueous	
2101196-01	C TS2-E-210122		22-Jan-21 16:50	Amber Glass NM Bottle, 1L	Aqueous	

Checkmarks indicate that information on the CoC reconciled with the sample label.  
Any discrepancies are noted in the following columns.

	Yes	No	NA	Comments:
Sample Container Intact?	<input checked="" type="checkbox"/>			
Sample Custody Seals Intact?			<input checked="" type="checkbox"/>	
Adequate Sample Volume?	<input checked="" type="checkbox"/>			
Container Type Appropriate for Analysis(es)	<input checked="" type="checkbox"/>			
Preservation Documented: Na2S2O3 Trizma <u>None</u> Other		<input checked="" type="checkbox"/>		
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			<input checked="" type="checkbox"/>	

Verified by/Date: 164 01/27/21



## LEVEL 2 DATA REVIEW SUMMARY

**Project Name:** LRTC 2020-2021 Storm Water

**Project Number:** 101-006-LRTC, Task 1

**Analyses:** EPA 1699

**Lab Order Number:** 2101196

**Sample Dates:** 8/4/2021

Laboratory QC Criteria	Yes	No	NA
Have all samples been extracted/analyzed within holding times?	X		
Are detection and reporting limits acceptable?	X		
Are all surrogate recoveries in all samples within QC limits?	X		
Are all LCS (BS) recoveries within QC limits?	X		
Are all MS/MSD recoveries and RPDs within QC limits?			X
Are method blanks free of contamination?		X <sup>2</sup>	
Are travel blanks free of contamination?			X
Are field/equipment blanks free of contamination?			X
Are all compounds present in either the sample or duplicate also present in the other?			X
Are all RPDs between sample and duplicate acceptable?			X

### Flags:

Sample ID	Compound	Det Flag	Lab Quals	Val Quals	Final Quals	Reportable Result?
TS2-E-210122	Hexachloro-benzene	--	B	--	B	Yes
	Methoxychlor	--	--	--	H	Yes <sup>1</sup>

B = the compound was also detected in the method blank

J = identification of the analyte is acceptable; reported value is an estimate (result is between laboratory detection and reporting limits)

### Comments:

1. Recovery for the following labeled standards were below the acceptable method limit: 13C12-Methoxychlor. All associated samples with detected results must be noted in any data transmittal (i.e., data tables).
2. Hexachlorobenzene was detected in the method blank at a concentration of 45.4 (J) pg/L. Sample result for hexachlorobenzene was B-flagged by the lab.
3. Results detected between detection limit and reporting limit (denoted "J") without other data flags omitted for brevity.

Reviewed by: 

Date: 8/4/2021

NOTE: Laboratory invoices should not be approved for payment until this review has been completed and all issues resolved.

February 02, 2021

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

## CDIM Engineering - San Francisco, CA

Sample Delivery Group: L1310207  
Samples Received: 01/26/2021  
Project Number:  
Description: LRTC Industrial Stormwater  
  
Report To: Bryan Starks  
45 Polk Street  
3rd Floor  
San Francisco, CA 94102

Entire Report Reviewed By:



Jennifer Gambill  
Project Manager

Results relate only to the items tested or calibrated and are reported as rounded values. This test report shall not be reproduced, except in full, without written approval of the laboratory. Where applicable, sampling conducted by Pace Analytical National is performed per guidance provided in laboratory standard operating procedures ENV-SOP-MTJL-0067 and ENV-SOP-MTJL-0068. Where sampling conducted by the customer, results relate to the accuracy of the information provided, and as the samples are received.

**Pace Analytical National**

12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 [www.pacenational.com](http://www.pacenational.com)

ACCOUNT:

CDIM Engineering - San Francisco, CA

PROJECT:

SDG:

L1310207

DATE/TIME:

02/02/21 10:38

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# SAMPLE SUMMARY

ONE LAB. NATIONWIDE.



## TS1-E-210122 L1310207-01 WW

Collected by  
BS/JR

Collected date/time  
01/22/21 16:04

Received date/time  
01/26/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1612444	1	01/27/21 15:44	01/27/21 17:16	MMF	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1613358	1	01/29/21 09:30	01/29/21 18:23	ERK	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1614159	1	01/31/21 14:39	01/31/21 14:39	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1611942	1	01/29/21 14:39	01/30/21 19:57	LD	Mt. Juliet, TN

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

## TS2-E-210122 L1310207-02 WW

Collected by  
BS/JR

Collected date/time  
01/22/21 16:50

Received date/time  
01/26/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1612444	1	01/27/21 15:44	01/27/21 17:16	MMF	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1613358	1	01/29/21 09:30	01/29/21 18:23	ERK	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1614159	1	01/31/21 14:39	01/31/21 14:39	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1611942	1	01/29/21 14:39	01/30/21 20:00	LD	Mt. Juliet, TN

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

## TS3-E-210122 L1310207-03 WW

Collected by  
BS/JR

Collected date/time  
01/22/21 17:07

Received date/time  
01/26/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1612444	1	01/27/21 15:44	01/27/21 17:16	MMF	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1613358	1	01/29/21 09:30	01/29/21 18:23	ERK	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1614159	1	01/31/21 14:39	01/31/21 14:39	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1611942	1	01/29/21 14:39	01/30/21 20:04	LD	Mt. Juliet, TN

<sup>8</sup> Al

<sup>9</sup> Sc

## TS4-E-210122 L1310207-04 WW

Collected by  
BS/JR

Collected date/time  
01/22/21 17:20

Received date/time  
01/26/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1612444	1	01/27/21 15:44	01/27/21 17:16	MMF	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1613358	1	01/29/21 09:30	01/29/21 18:23	ERK	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1614159	1	01/31/21 14:39	01/31/21 14:39	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1611942	1	01/29/21 14:39	01/30/21 20:08	LD	Mt. Juliet, TN

## TSX-E-210122 L1310207-05 WW

Collected by  
BS/JR

Collected date/time  
01/22/21 16:08

Received date/time  
01/26/21 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Gravimetric Analysis by Method 2540 D-2011	WG1612444	1	01/27/21 15:44	01/27/21 17:16	MMF	Mt. Juliet, TN
Wet Chemistry by Method 1664A	WG1613358	1	01/29/21 09:30	01/29/21 18:23	ERK	Mt. Juliet, TN
Wet Chemistry by Method 4500H+ B-2011	WG1614159	1	01/31/21 14:39	01/31/21 14:39	KPS	Mt. Juliet, TN
Metals (ICPMS) by Method 200.8	WG1611942	1	01/29/21 14:39	01/30/21 18:42	LD	Mt. Juliet, TN

ACCOUNT:

CDIM Engineering - San Francisco, CA

PROJECT:

SDG:

L1310207

DATE/TIME:

02/02/21 10:38

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All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Jennifer Gambill  
Project Manager

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc





## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	5.80		0.350	2.50	1	01/27/2021 17:16	<a href="#">WG1612444</a>

1 Cp

2 Tc

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	U		1.29	5.56	1	01/29/2021 18:23	<a href="#">WG1613358</a>

3 Ss

4 Cn

## Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.85	<a href="#">T8</a>	1	01/31/2021 14:39	<a href="#">WG1614159</a>

5 Sr

6 Qc

## Sample Narrative:

L1310207-01 WG1614159: 7.85 at 19C

7 Gl

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	0.0656	<a href="#">J</a>	0.0470	0.100	1	01/30/2021 19:57	<a href="#">WG1611942</a>
Iron	0.128		0.0447	0.100	1	01/30/2021 19:57	<a href="#">WG1611942</a>
Lead	0.00214		0.000513	0.00200	1	01/30/2021 19:57	<a href="#">WG1611942</a>
Zinc	0.0487		0.00796	0.0200	1	01/30/2021 19:57	<a href="#">WG1611942</a>

8 Al

9 Sc



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	2.30	J	0.350	2.50	1	01/27/2021 17:16	<a href="#">WG1612444</a>

1 Cp

2 Tc

3 Ss

4 Cn

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	U		1.29	5.56	1	01/29/2021 18:23	<a href="#">WG1613358</a>

5 Sr

6 Qc

## Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.84	T8	1	01/31/2021 14:39	<a href="#">WG1614159</a>

7 Gl

8 Al

## Sample Narrative:

L1310207-02 WG1614159: 7.84 at 19.1C

9 Sc

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	U		0.0470	0.100	1	01/30/2021 20:00	<a href="#">WG1611942</a>
Iron	0.0559	J	0.0447	0.100	1	01/30/2021 20:00	<a href="#">WG1611942</a>
Lead	0.00146	J	0.000513	0.00200	1	01/30/2021 20:00	<a href="#">WG1611942</a>
Zinc	0.120		0.00796	0.0200	1	01/30/2021 20:00	<a href="#">WG1611942</a>



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	U		0.350	2.50	1	01/27/2021 17:16	<a href="#">WG1612444</a>

1 Cp

2 Tc

3 Ss

4 Cn

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	U		1.29	5.56	1	01/29/2021 18:23	<a href="#">WG1613358</a>

5 Sr

6 Qc

## Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.56	<a href="#">T8</a>	1	01/31/2021 14:39	<a href="#">WG1614159</a>

7 Gl

8 Al

## Sample Narrative:

L1310207-03 WG1614159: 7.56 at 19.1C

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	U		0.0470	0.100	1	01/30/2021 20:04	<a href="#">WG1611942</a>
Iron	0.142		0.0447	0.100	1	01/30/2021 20:04	<a href="#">WG1611942</a>
Lead	0.000969	<a href="#">J</a>	0.000513	0.00200	1	01/30/2021 20:04	<a href="#">WG1611942</a>
Zinc	0.0370		0.00796	0.0200	1	01/30/2021 20:04	<a href="#">WG1611942</a>

9 Sc



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	1.70	J	0.350	2.50	1	01/27/2021 17:16	<a href="#">WG1612444</a>

1 Cp

2 Tc

3 Ss

4 Cn

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	U		1.29	5.56	1	01/29/2021 18:23	<a href="#">WG1613358</a>

5 Sr

6 Qc

## Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.72	T8	1	01/31/2021 14:39	<a href="#">WG1614159</a>

7 Gl

8 Al

## Sample Narrative:

L1310207-04 WG1614159: 7.72 at 19.1C

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	U		0.0470	0.100	1	01/30/2021 20:08	<a href="#">WG1611942</a>
Iron	0.0476	J	0.0447	0.100	1	01/30/2021 20:08	<a href="#">WG1611942</a>
Lead	0.000966	J	0.000513	0.00200	1	01/30/2021 20:08	<a href="#">WG1611942</a>
Zinc	0.0577		0.00796	0.0200	1	01/30/2021 20:08	<a href="#">WG1611942</a>

9 Sc



## Gravimetric Analysis by Method 2540 D-2011

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Suspended Solids	5.30		0.350	2.50	1	01/27/2021 17:16	<a href="#">WG1612444</a>

1 Cp

2 Tc

3 Ss

4 Cn

## Wet Chemistry by Method 1664A

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Oil & Grease (Hexane Extr)	U	<a href="#">J3 J6</a>	1.29	5.56	1	01/29/2021 18:23	<a href="#">WG1613358</a>

5 Sr

## Wet Chemistry by Method 4500H+ B-2011

Analyte	Result	Qualifier	Dilution	Analysis date / time	Batch
pH	7.89	<a href="#">T8</a>	1	01/31/2021 14:39	<a href="#">WG1614159</a>

6 Qc

7 Gl

## Sample Narrative:

L1310207-05 WG1614159: 7.89 at 19.5C

8 Al

## Metals (ICPMS) by Method 200.8

Analyte	Result	Qualifier	MDL	RDL	Dilution	Analysis date / time	Batch
Aluminum	0.0657	<a href="#">J</a>	0.0470	0.100	1	01/30/2021 18:42	<a href="#">WG1611942</a>
Iron	0.112		0.0447	0.100	1	01/30/2021 18:42	<a href="#">WG1611942</a>
Lead	0.00167	<a href="#">J</a>	0.000513	0.00200	1	01/30/2021 18:42	<a href="#">WG1611942</a>
Zinc	0.0450		0.00796	0.0200	1	01/30/2021 18:42	<a href="#">WG1611942</a>

9 Sc

Method Blank (MB)

(MB) R3617115-1 01/27/21 17:16

	MB Result	MB Qualifier	MB MDL	MB RDL
Analyte	mg/l		mg/l	mg/l
Suspended Solids	U		0.350	2.50

1

Cp

2

Tc

3

Ss

4

Cn

5

Sr

6

Qc

7

Gl

8

Al

9

Sc

L1309830-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1309830-01 01/27/21 17:16 • (DUP) R3617115-3 01/27/21 17:16

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Suspended Solids	262	245	1	6.58	J3	5

L1310196-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1310196-01 01/27/21 17:16 • (DUP) R3617115-4 01/27/21 17:16

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	mg/l	mg/l		%		%
Suspended Solids	592	600	1	1.34		5

Laboratory Control Sample (LCS)

(LCS) R3617115-2 01/27/21 17:16

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	mg/l	mg/l	%	%	
Suspended Solids	773	728	94.2	85.7-114	



Method Blank (MB)

(MB) R3617632-1 01/29/21 18:23

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Oil & Grease (Hexane Extr)	U		1.16	5.00

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3617632-2 01/29/21 18:23 • (LCSD) R3617632-3 01/29/21 18:23

Analyte	Spike Amount mg/l	LCS Result mg/l	LCSD Result mg/l	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Oil & Grease (Hexane Extr)	40.0	41.1	33.7	103	84.3	78.0-114			19.8	20

L1310207-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1310207-05 01/29/21 18:23 • (MS) R3617632-4 01/29/21 18:23 • (MSD) R3617632-5 01/29/21 18:23

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Oil & Grease (Hexane Extr)	40.0	U	25.6	32.3	63.9	80.8	1	78.0-114	J6	J3	23.4	18



L1310196-01 Original Sample (OS) • Duplicate (DUP)

(OS) L1310196-01 01/31/21 14:39 • (DUP) R3617933-2 01/31/21 14:39

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.65	7.63	1	0.262		1

Sample Narrative:

OS: 7.65 at 19.2C

DUP: 7.63 at 19.1C

<sup>1</sup>Cp

<sup>2</sup>Tc

<sup>3</sup>Ss

<sup>4</sup>Cn

<sup>5</sup>Sr

<sup>6</sup>Qc

<sup>7</sup>Gl

<sup>8</sup>Al

<sup>9</sup>Sc

L1310235-06 Original Sample (OS) • Duplicate (DUP)

(OS) L1310235-06 01/31/21 14:39 • (DUP) R3617933-3 01/31/21 14:39

	Original Result	DUP Result	Dilution	DUP RPD	DUP Qualifier	DUP RPD Limits
Analyte	su	su		%		%
pH	7.68	7.65	1	0.391		1

Sample Narrative:

OS: 7.68 at 20.7C

DUP: 7.65 at 19.1C

Laboratory Control Sample (LCS)

(LCS) R3617933-1 01/31/21 14:39

	Spike Amount	LCS Result	LCS Rec.	Rec. Limits	LCS Qualifier
Analyte	su	su	%	%	
pH	10.0	10.1	101	99.0-101	

Sample Narrative:

LCS: 10.05 at 19.3C





Method Blank (MB)

(MB) R3617936-1 01/30/21 18:21

Analyte	MB Result mg/l	MB Qualifier	MB MDL mg/l	MB RDL mg/l
Aluminum	U		0.0470	0.100
Iron	U		0.0447	0.100
Lead	U		0.000513	0.00200
Zinc	U		0.00796	0.0200

<sup>1</sup> Cp

<sup>2</sup> Tc

<sup>3</sup> Ss

<sup>4</sup> Cn

<sup>5</sup> Sr

<sup>6</sup> Qc

<sup>7</sup> Gl

<sup>8</sup> Al

<sup>9</sup> Sc

Laboratory Control Sample (LCS)

(LCS) R3617936-2 01/30/21 18:24

Analyte	Spike Amount mg/l	LCS Result mg/l	LCS Rec. %	Rec. Limits %	LCS Qualifier
Aluminum	5.00	4.86	97.2	85.0-115	
Iron	5.00	5.04	101	85.0-115	
Lead	0.0500	0.0500	99.9	85.0-115	
Zinc	0.500	0.493	98.7	85.0-115	

L1309987-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1309987-01 01/30/21 18:28 • (MS) R3617936-4 01/30/21 18:35 • (MSD) R3617936-5 01/30/21 18:38

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	5.00	0.245	5.13	5.14	97.8	97.9	1	70.0-130			0.180	20
Iron	5.00	0.147	5.19	5.09	101	98.8	1	70.0-130			2.03	20
Lead	0.0500	0.00191	0.0496	0.0495	95.4	95.1	1	70.0-130			0.337	20
Zinc	0.500	0.139	0.568	0.568	85.8	85.9	1	70.0-130			0.0870	20

L1310207-05 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L1310207-05 01/30/21 18:42 • (MS) R3617936-6 01/30/21 18:46 • (MSD) R3617936-7 01/30/21 18:49

Analyte	Spike Amount mg/l	Original Result mg/l	MS Result mg/l	MSD Result mg/l	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aluminum	5.00	0.0657	4.86	4.81	95.8	94.9	1	70.0-130			0.964	20
Iron	5.00	0.112	5.24	4.91	103	96.0	1	70.0-130			6.55	20
Lead	0.0500	0.00167	0.0517	0.0512	100	99.0	1	70.0-130			1.01	20
Zinc	0.500	0.0450	0.552	0.524	101	95.7	1	70.0-130			5.20	20



## Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

### Abbreviations and Definitions

MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
U	Not detected at the Reporting Limit (or MDL where applicable).
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state "ND" (Not Detected) or "BDL" (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

### Qualifier Description

J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.
T8	Sample(s) received past/too close to holding time expiration.

1 Cp

2 Tc

3 Ss

4 Cn

5 Sr

6 Qc

7 Gl

8 Al

9 Sc



Pace National is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our one location design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be YOUR LAB OF CHOICE.

\* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

\* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace National.

### Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN, 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico <sup>1</sup>	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina <sup>1</sup>	DW21704
Georgia	NELAP	North Carolina <sup>3</sup>	41
Georgia <sup>1</sup>	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO00356
Kentucky <sup>1 6</sup>	KY90010	South Carolina	84004002
Kentucky <sup>2</sup>	16	South Dakota	n/a
Louisiana	AI30792	Tennessee <sup>1 4</sup>	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas <sup>5</sup>	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP, LLC EMLAP	100789
A2LA – ISO 17025 <sup>5</sup>	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

### Pace Analytical National 1313 Point Mallard Parkway SE Suite B Decatur, AL, 35601

Alabama	40160
ANSI National Accreditation Board	L2239

### Pace Analytical National 660 Bercut Dr. Ste. C Sacramento, CA, 95811

California	2961	Oregon	CA300002
Minnesota	006-999-465	Washington	C926
North Dakota	R-214		

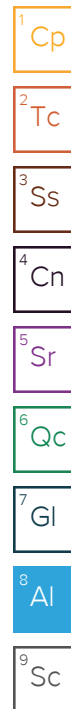
### Pace Analytical National 6000 South Eastern Avenue Ste 9A Las Vegas, NV, 89119

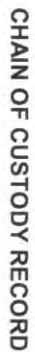
Nevada	NV009412021-1
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### Pace Analytical National 1606 E. Brazos Street Suite D Victoria, TX, 77901

Texas	T104704328-20-18
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<sup>1</sup> Drinking Water <sup>2</sup> Underground Storage Tanks <sup>3</sup> Aquatic Toxicity <sup>4</sup> Chemical/Microbiological <sup>5</sup> Mold <sup>6</sup> Wastewater n/a Accreditation not applicable





## CHAIN OF CUSTODY RECORD

20157

<b>LABORATORY:</b> ESC Laboratory 12065 Lebanon Road, Mt. Juliet, TN 37122 (615) 773-9670 Jennifer Garbille jgarbille@escenvironmental.com		<b>INSTRUCTIONS FOR LAB PERSONNEL:</b> Please send analytic results, electronic deliverables and the original chain-of-custody form to: jgarbille@escenvironmental.com, msc@escenvironmental.com		<b>Analysis Turnaround Time</b> X Standard <input type="checkbox"/> Other GeoTracker EDF required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No LOUIS EDD required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Report Results to: <input type="checkbox"/> FL <input checked="" type="checkbox"/> MDL Report soil results to: <input type="checkbox"/> wet weight (total) <input type="checkbox"/> dry weight	
<b>CDM CONTACT:</b> CDM Engineering 45 Polk Street, 3rd Floor San Francisco, California 94102 Project Manager: Bryan Starks Phone Number: 415-498-0535 Sampled by: <u>BS/JSR</u> Sample date(s): <u>1/22/21</u>		<b>PROJECT INFORMATION</b> Job Name: LRTC Industrial Stormwater Job #: _____ Address: 402 Wright Avenue, Richmond CA 94804		<b>ANALYSIS REQUESTED</b> CQC Number: _____ Page <u>1</u> of <u>1</u> SDG number: _____ Sample Specific Notes: _____	
Lab ID	Sample Identification	Sample Date	Sample Matrix	# of Cont.	pH (SM 4500HB)
	TS1-E-210122	01-22-21	W	4	Total Suspended Solids (SM 2540D)
	TS2-E-210122	01-22-21	W	4	Oil & Grease (EPA 1664A SGT-HEM)
	TS3-E-210122	01-22-21	W	4	Total Metals- Al, Fe, Pb, Zn (EPA 200.8 ICP-MS)
	TS4-E-210122	01-22-21	W	4	
	TSX-E-210122	01-22-21	W	12	
	<u>TSX-210122</u>	<u>01-22-21</u>			
	<u>TS-85</u>				
Field Filtered (X):					
Preservation Used: 1= Ice, 2= HCl, 3= H <sub>2</sub> SO <sub>4</sub> , 4=HNO <sub>3</sub> , 5=NaOH, 6= Other					
<b>Special Instructions/QC Requirements &amp; Comments:</b> Level II Report. Report with reporting limit and method detection limit. Analyze and report only the metals listed above.					
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
<u>Bryan Starks</u>	CDM	1/22/21 1800	<u>John Pollock</u>	CDM	1/22/21 1800
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
<u>John Pollock</u>	CDM	1/23/21 0843	<u>Joseph M. Reed</u>	CDM	1/26/21 0900
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
* = Samples received from a secured, locked area					
x = Samples released to a secured, locked area.		MOBILE # <u>408 256 9230</u>			
SAMPLES NAME <u>Bryan Starks</u>		DATE / TIME <u>1/22/21</u>			
SIGNATURE <u>[Signature]</u>		DATE / TIME <u>1/22/21</u>			

1051

	<u>Sample</u>	<u>Receipt</u>	<u>Checklist</u>
COC Seal Present/Intact:	N	N	If Applicable
COC Signed/Accurate:	N	N	VOA Zero Headspace
Bottles active /Inagc:	N	N	Fres./Correct/Check:
Correct bottles used:	N	N	
Sufficient volume sent:	N	N	
PAD Screen <0.5 mR/hr:	N	N	



## LEVEL 2 DATA REVIEW SUMMARY

**Project Name:** LRTC 2020-2021 Storm Water

**Project Number:** 101-006-LRTC, Task 1

**Analyses:** EPA 200.8, 1664A, SM 4500H+B; SM2540D

**Lab Order Number:** L1310207

**Sample Dates:** 01/22/21

Laboratory QC Criteria	Yes	No	NA
Have all samples been extracted/analyzed within holding times?		X <sup>1</sup>	
Are detection and reporting limits acceptable?	X		
Are all surrogate recoveries in all samples within QC limits?			X
Are all LCS (BS) recoveries within QC limits?	X		
Are all MS/MSD recoveries and RPDs within QC limits?		X <sup>2</sup>	
Are method blanks free of contamination?	X		
Are travel blanks free of contamination?			X
Are field/equipment blanks free of contamination?			X
Are all compounds present in either the sample or duplicate also present in the other?	X		
Are all RPDs between sample and duplicate acceptable?	X <sup>3</sup>		

### Flags:

Sample ID	Compound	Det Flag	Lab Quals	Val Quals	Final Quals	Reportable Result?
TS1-E-210122 TS2-E-210122 TS3-E-210122 TS4-E-210122 TSX-E-210122	pH	--	T8	--	none	Yes
TS1-E-210122	Aluminum	J	--	--	J	Yes
TS1-E-210122	Oil and Grease	'--	--	J	J*	Yes
TS2-E-210122	Suspended Solids	J	--	--	J	Yes
TS2-E-210122	Iron	J	--	--	J	Yes
TS2-E-210122	Lead	J	--	--	J	Yes
TS3-E-210122	Lead	J	--	--	J	Yes
TS4-E-210122	Suspended Solids	J	--	--	J	Yes
TS4-E-210122	Iron	J	--	--	J	Yes

NOTE: Laboratory invoices should not be approved for payment until this review has been completed and all issues resolved.



Sample ID	Compound	Det Flag	Lab Quals	Val Quals	Final Quals	Reportable Result?
TS4-E-210122	Lead	J	--	--	J	Yes
TSX-E-210122	Oil & Grease	J3 J6	--	--	J3 J6	Yes
TSX-E-210122	Aluminum	J	--	--	J	Yes
TSX-E-210122	Lead	J	--	--	J	Yes

J = identification of the analyte is acceptable; reported value is an estimate (result is between laboratory detection and reporting limits)

J3 = The associated batch QC was outside the established quality control range for precision

J6 = The sample matrix interfered with the ability to make any accurate determination; spike value is low

T8 = samples received past/too close to holding time expiration

**Comments:**

1. pH not analyzed within 15 minutes of sampling, however analyzed upon receipt by laboratory.
2. Matrix spike recovery and MS/MSD RPD for suspended solids using project sample TSX-E-210122 were outside of acceptable laboratory quality control range. Since recovery was low, the sample results for both TSX-E-210122 and TS2-E-210122, the primary sample with which this duplicate is associated, may be biased low. The suspended solids result for TSX-E-210122 was flagged by laboratory; we are adding qualifiers to sample TS2-E-210122 result as well.
3. Laboratory reported primary and duplicate sample for total suspended solids were outside of acceptable laboratory quality control range for RPD. However, the sample was not from this project and therefore no flags are needed. Primary and duplicate field samples are within acceptable RPD ranges.

Reviewed by:

Date: 2/4/21



## **APPENDIX C**

### Seep Inspection Field Forms







## **APPENDIX D**

### **Upland Capping System Inspection Form**

**Former United Heckathorn Superfund Site Upland Capping System Inspection Form**  
**Levin Richmond Terminal, 402 Wright Avenue, Richmond, California**

**I. General Information**

<b>Site:</b>	Former United Heckathorn Superfund Site, Levin Richmond Terminal	<b>Inspector:</b>	Bryan Starks and Scott Bourne
<b>Address:</b>	402 Wright Avenue, Richmond, CA	<b>Organization:</b>	CDIM
		<b>Date and time of inspection:</b>	5/5/2021 900

**II. Upland Area Concrete Cap, Gravel Cover, and Drainage System Observations**

*Note significant cracks, holes, penetrations, damage, settlement, or any exposure of underlying soil in any component of the capping system.*

**North Main Terminal (SW-3)**

**Yes No N/A Comments**

Are concrete cap surfaces in adequate condition to promote effectiveness of the cap?

☒ ☐ ☐

Are gravel cover surfaces in adequate condition to promote effectiveness of the cap?

☒ ☐ ☐

Is storm water drainage infrastructure (interceptors, drain inlets) in adequate condition to prevent exposure of underlying soil to runoff?

☒ ☐ ☐

Is accumulated sediment observed in the interceptors or drain inlets?  
If yes, note location and photograph.

☐ ☒ ☐

Are corrective actions required?

☐ ☒ ☐

Attach a photograph of areas requiring corrective action.

☐ ☐ ☒

Describe any recent repairs/maintenance:

*None.*

*Drain inlets equipped with drain inlet filters. Drain inlet protection is inspected regularly and replaced as needed.*

*Cap generally appeared in good condition with typical surficial cracking and seams evident. No threat of exposure of underlying soils observed.*

Describe conditions and locations of the capping system which require attention:

*Continue to monitor cracks and seams.*

Describe corrective actions required and their date(s) of implementation:

*None.*



Inspector Signature:

Date: 5/5/2021

**Former United Heckathorn Superfund Site Upland Capping System Inspection Form**

**Levin Richmond Terminal, 402 Wright Avenue, Richmond, California**

**North Main Terminal/United Heckathorn (SW-4)**

**Yes No N/A Comments**

Are concrete cap surfaces in adequate condition to promote effectiveness of the cap?

☒ ☐ ☐

Are gravel cover surfaces in adequate condition to promote effectiveness of the cap?

☒ ☐ ☐

Is storm water drainage infrastructure (interceptors, drain inlets) in adequate condition to prevent exposure of underlying soil to runoff?

☒ ☐ ☐

Is accumulated sediment observed in the interceptors or drain inlets?  
If yes, note location and photograph.

☐ ☒ ☐

Are corrective actions required?

☐ ☒ ☐

Attach a photograph of areas requiring corrective action.

☐ ☐ ☒

Describe any recent repairs/maintenance:

*None.*

Describe conditions and locations of the capping system which require attention:

*Drain inlets equipped with drain inlet filters. Drain inlet protection is inspected regularly and replaced as needed.*

*Cap generally appeared in good condition with typical surficial cracking and seams evident. No threat of exposure of underlying soils observed.*

Describe corrective actions required and their date(s) of implementation:

*Continue to monitor cracks and seams.*



Inspector Signature:

Date: 5/5/2021

**Former United Heckathorn Superfund Site Upland Capping System Inspection Form**

**Levin Richmond Terminal, 402 Wright Avenue, Richmond, California**

**North Main Terminal/United Heckathorn (SW-5)**

**Yes No N/A Comments**

Are concrete cap surfaces in adequate condition to promote effectiveness of the cap?

☒ ☐ ☐

Are gravel cover surfaces in adequate condition to promote effectiveness of the cap?

☒ ☐ ☐

Is storm water drainage infrastructure (interceptors, drain inlets) in adequate condition to prevent exposure of underlying soil to runoff?

☒ ☐ ☐

Is accumulated sediment observed in the interceptors or drain inlets?  
If yes, note location and photograph.

☐ ☒ ☐

Are corrective actions required?

☐ ☒ ☐

Attach a photograph of areas requiring corrective action.

☐ ☐ ☒

Describe any recent repairs/maintenance:

*None.*

Describe conditions and locations of the capping system which require attention:

*Drain inlets equipped with drain inlet filters. Drain inlet protection is inspected regularly and replaced as needed.*

*Cap generally appeared in good condition with typical surficial cracking and seams evident. Sufficient gravel. No threat of exposure of underlying soils observed.*

Describe corrective actions required and their date(s) of implementation:

*Continue to monitor cracks and seams.*

*Gravel cover should continue to be monitored, and additional gravel placed as needed.*



Inspector Signature:

Date: 5/5/2021

**Former United Heckathorn Superfund Site Upland Capping System Inspection Form**

**Levin Richmond Terminal, 402 Wright Avenue, Richmond, California**

**North Main Terminal/United Heckathorn (SW-6)**

**Yes No N/A Comments**

Are concrete cap surfaces in adequate condition to promote effectiveness of the cap?

☒ ☐ ☐

Are gravel cover surfaces in adequate condition to promote effectiveness of the cap?

☒ ☐ ☐

Is storm water drainage infrastructure (interceptors, drain inlets) in adequate condition to prevent exposure of underlying soil to runoff?

☒ ☐ ☐

Is accumulated sediment observed in the interceptors or drain inlets?  
If yes, note location and photograph.

☐ ☒ ☐

Are corrective actions required?

☒ ☐ ☐

Reinspection on 5/28 (see below)

Attach a photograph of areas requiring corrective action.

☐ ☒ ☐

Describe any recent repairs/maintenance:

*None.*

Describe conditions and locations of the capping system which require attention:

*CDIM returned during low tide to inspect the area seepage was observed at base of pile (approximately 0.5 ft. MLLW) adjacent to City of Richmond outfall at back of Lauritzen Channel. No seepage was observed.*

*Cap generally appeared in good condition with typical surficial cracking and seams evident. Sufficient gravel. No threat of exposure of underlying soils observed.*

Describe corrective actions required and their date(s) of implementation:

*CDIM will reinspect the area during extreme low tide on Friday, 5/28 (-1.94 at 8:13AM).*

*Continue to monitor cracks and seams.*

*Gravel cover should continue to be monitored, and additional gravel placed as needed.*



Inspector Signature:

Date: 5/5/2021

**Former United Heckathorn Superfund Site Upland Capping System Inspection Form**

**Levin Richmond Terminal, 402 Wright Avenue, Richmond, California**

**North Main Terminal/United Heckathorn (SW-7)**

**Yes No N/A Comments**

Are concrete cap surfaces in adequate condition to promote effectiveness of the cap?

☒ ☐ ☐

Are gravel cover surfaces in adequate condition to promote effectiveness of the cap?

☒ ☐ ☐

Is storm water drainage infrastructure (interceptors, drain inlets) in adequate condition to prevent exposure of underlying soil to runoff?

☒ ☐ ☐

Is accumulated sediment observed in the interceptors or drain inlets?  
If yes, note location and photograph.

☐ ☒ ☐

Are corrective actions required?

☐ ☒ ☐

Attach a photograph of areas requiring corrective action.

☐ ☐ ☒

Describe any recent repairs/maintenance:

*None.*

Describe conditions and locations of the capping system which require attention:

*Cap generally appeared in good condition with typical surficial cracking and seams evident. Sufficient gravel. No threat of exposure of underlying soils observed.*

Describe corrective actions required and their date(s) of implementation:

*Continue to monitor cracks and seams.*

*Gravel cover should continue to be monitored, and additional gravel placed as needed.*



Inspector Signature:

Date: 5/5/2021